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A New Business: A Case Study

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Game-Winning Tips

24 AT-A-GLANCE SOFTWARE REVIEWS

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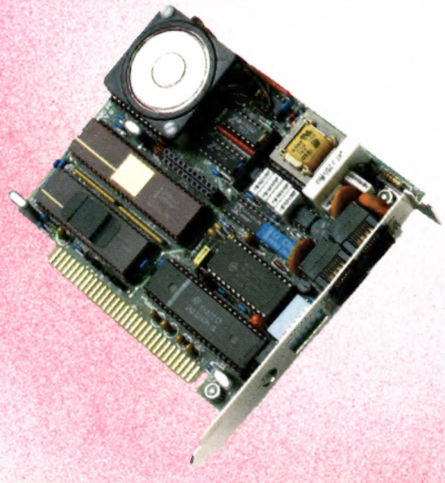

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CIRCLE READER SERVICE 25

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OCTOBER
1986

VOLUME 4
NUMBER 10

FAMILY COMPUTING®

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This fifth-generation Apple II delivers improved graphics, sound and speed. Read all about it in this special preview.
PLUS: APPLE IIGS FACTS

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COVER PHOTOGRAPH BY ROGER RESSMEYER/STARLIGHT

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EDITOR'S NOTE

What Did You Do At School Today?

Even though *Beverly Hills Cop* is hardly news anymore, I still react whenever I see a Mumford High School sweatshirt, like the one Eddie Murphy wore, going down the street. My alma mater. It almost qualifies me as a minor celebrity.

I can't recall ever having seen a student wear a shirt like Murphy's back in my high school days. It sure wasn't why anyone thought of Mumford High back then. Instead, it was a school renowned for the quality of its education, which was attributable in large part to the involvement of parents in every facet of the school's program.

If personal computers had existed when I went to Mumford, I'm sure that at least half of the student body would have had one at home. Our parents did all they could to enhance their kids' learning.

Today, ask a kid, "What did you do at school today?" and the odds are good that using a computer will be part of the answer. While computers may seem omnipresent in many schools, the reality is that there are seldom enough machines or time to allow most students to use them to great advantage. The desire to provide their children with endless exposure to a computer—their own—is what motivates many parents to buy a computer in the first place.

But using a computer for learning at home is very different from using one at school. Parents need help, they told us, in understanding the differences and putting their computers to good use. That is why we created our "Parents' Guide to Learning at Home with Computers," which debuted last fall. Reader response turned it into an annual feature; you'll find our "Second Annual Parents' Guide" on page 33.

More welcome news for readers is our new department, "Machine Specifics" (page 26), which gives you inside reports on major computer companies, news, and answers to commonly asked questions on a brand-by-brand basis. Starting next month, we'll be adding a section that covers out-of-production systems.

As computers become more widely used, there is a parallel increase in the number of people starting businesses out of their homes. Here, too, we've discovered the need for help, both with computer applications and with business basics. If you're running your own business, or dreaming of starting one, you'll probably find a lot of useful information in "Setting Up a New Business" (page 49).

These are just three ways in which we continue to respond to readers' requests and needs. It's up to all of you to keep letting us know if we still get passing grades.

Claudia Cohl

CLAUDIA COHL
EDITOR-IN-CHIEF

P.S. One side effect of *Beverly Hills Cop*, and a major benefit to Mumford High, was the money generated by sweatshirt and T-shirt sales. A large part of the proceeds went toward buying computers for the school.

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CIRCLE READER SERVICE 9

LETTERS

DIALING FOR MAIL ORDER

I note that on page 32 of your July 1986 issue, you compare some of the low-cost IBM compatibles and their vendors, including one machine from The Diversified Group of Los Angeles.

On April 1, 1986, I ordered two DG systems with clock/serial/parallel/game ports. The order-taker said they would be shipped in 10 days, after assembly and testing. On April 24, The Diversified Group charged my VISA account $1,983.29. As of June 21, 1986, neither system was functioning properly.

On June 25, I called Diversified and was informed that a new unit would be shipped to me on July 2. When I called to check on that day, the shipping clerk revised the date to July 18. The person I talked to said because I had written directly to Chuck Campbell, president of The Diversified Group, that Mr. Campbell was handling my account personally. To date, I have not heard from Mr. Campbell by mail or by telephone, nor has there been a message left on our answering machine.

I will keep you informed of any progress in my quest for an operable IBM-compatible computer system or authorization to return the entire order for complete refund without the 15-percent restocking fee The Diversified Group threatened to charge.

RICHARD S. DOWNIE
Everett, Washington

I just finished reading Dan Gutman's cover story in the August issue. As a longtime mail-order buyer, I agree with his comments on an often-ignored method of obtaining products.

Since he lives in New York, Mr. Gutman feels that mail-order buying cannot always give you the most current product, but this is not always the case. I cannot count the number of times that I have bought the "latest" software from firms like Protecto, long before my local computer store had it on the shelf. A recent case was the *The Print Shop Companion* for my Commodore 64.

I have also found a much greater selection through the mail. The firms I have dealt with were very honest about their products and never

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CIRCLE READER SERVICE 27

tried to push me to buy something I didn't want. They also didn't pretend to know things about software, as store employees sometimes do.

SHEILA C. PERINO, PhD
Setauket, New York

AN APOLOGY

On the behalf of Writing Software International, I wish to extend an apology to those readers of your magazine who may have been offended by the caption on our recent advertisement. It was an attempt, through humor, to attract attention to the fact that our Bard's *ProAm* word-processing product is very easy to use. The idea for this ad came from the theme of the popular movie, *Network*.

Although the vast majority of your readers and our customers seem to have taken this advertisement as we intended it, as harmless humor, we regret that some FAMILY COMPUTING readers found it in poor taste. Thus, we have permanently withdrawn the advertisement from publication.

SPENCER L. MANLOVE
President
Writing Software International
Missoula, Montana

EIGHT-BIT DESERVES RESPECT

I just read your review on major-brand computers in your June issue.

The 8-bit Ataris were briefly mentioned under the Atari heading. I have owned an Atari 800XL for almost two years now. The dollar-to-performance ratio the 8-bit Ataris offer in today's computer market is second-to-none, and the support that Atari users' groups offer in this new industry is hard to beat.

Atari has always been the Rodney Dangerfield of the computer industry. Even though the game image originally tinted public opinion of the machines, Atari was the first machine to bring advanced graphics and sound capabilities to the low-priced home market. Hardware upgrades, including memory and 80-column display boards, are readily available and allow for serious applications.

In addition, the Atari 800 series computers carry an extensive software base and offer an excellent dollar-to-performance ratio for the home market.

WAYNE WILT
Herndon, Virginia

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CIRCLE READER SERVICE 21

LETTERS

PROS . . .

Thank you for your articles "Give Your Kids a Simple Lesson in Spreadsheets" (*Home-School Connection, July 1986*) and "Set Up a Comfortable Workspace to Increase Productivity" (*Home Office, July 1986*).

Thanks to you, I now have a quiet place to work, a weekly budget, and I'm setting up a word-processing business. You helped me a great deal.

JEN EARLEY
Rosalia, Washington

I must say that I do really enjoy your magazine, but what in the world happened to "Helpful Hints?" I am really disappointed. It hasn't appeared since your June issue. The hints really helped me save money and time. In fact, for me, it was the most beneficial section of the entire magazine. If you are not going to continue to run it, please tell me so I won't get my hopes up!

JASON ECKHARDT
Lambertville, Michigan

EDITOR'S NOTE: *Fear not! We're planning to print more "Helpful Hints" in upcoming issues.*

. . . AND CONS

Your June 1986 "Buyer's Guide to Personal Computers" is interesting and informative, but I would like to comment on what you call the "weaknesses" of the Tandy 1000.

Your article implies that the Tandy 1000's inability to use full-length IBM-compatible cards is a liability because it forces buyers to use only the limited (and expensive) offerings from Tandy. This is just not true, in my opinion.

For instance, take a look at the myriad of IBM-compatible cards. Many of them add monochrome/color graphics drivers, parallel printer ports, and game ports—features that already come with the Tandy 1000.

May I suggest that you devote an article to the Tandy 1000 and its expandability. I think the research you do will help owners of this very popular computer see just how much is available for the Tandy 1000.

DAVID C. KIRSCH
Tecumseh, Michigan

KUDOS . . .

I recently sent in my completed survey on the features of The Programmer section of your magazine, and I listed and rated several favorite programs that I have typed on my Apple

IIe. If I were to fill it out today, *Electronic Typewriter* would be far and away my favorite program. It is really a handy, fun program, and I just wanted you to know how much I enjoy using it. This is the type of program that I want to see in The Programmer section.

I really enjoy FAMILY COMPUTING and look forward to its arrival each month. As an avid Apple user, I appreciate the attention that your magazine gives to the IIe. I also like to read news about other computers on the market, especially the Macintosh.

JIM DAVIS
Warrensburg, Missouri

CORRECTIONS . . .

I am always impressed by the quality of your articles. However, there are two errors in the "Buyer's Guide to Music Hardware and Software" in your August issue. First, on the chart, it says that *The Music Studio*, by Activision, will not record. But many programs that support MIDI will capture notes played on the keyboard. It's not a real-time capture of the notes, but it does work on my Atari 520 ST.

Second: The chart says that *Bank Street Music Writer* will not save or load music once you have written it. I rather fancy that this is a typographical error, since the program obviously supports these features.

SHAILAR BROWN
Aledo, Texas

. . . AND SUGGESTIONS

I have a suggestion for the reader who wrote to the "Computing Clinic" (*August 1986*), asking how to print low-resolution graphics for her students. I use *The Printographer* (Roger Wagner Publishing Inc.) for this purpose.

It easily permits enlargement, change of background, cropping, and other changes. My copy is several years old and does not mention printing in color, but perhaps newer versions of the program do.

ANN KREAMER
Fort Wayne, Indiana

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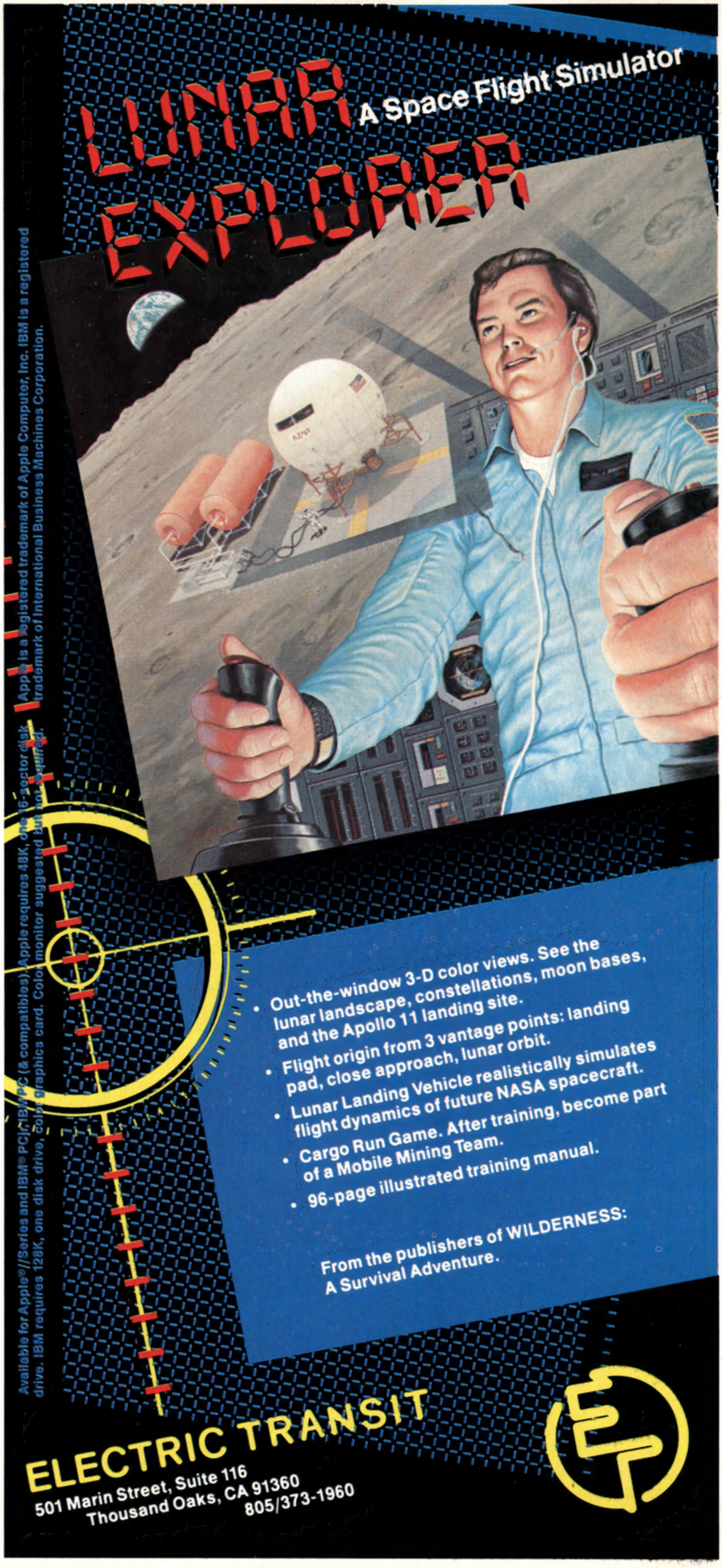
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Save Time and Keystrokes by Making MS-DOS Work For You

BY R. STEPHEN BLOCH

Since I am a relatively new computer owner (Leading Edge Model D), one of the most frustrating experiences has been the lack of understandable instructions, especially on how to make my computer do what it is supposed to do—make my work easier. Only after struggling through three different books on MS-DOS and finally discovering the excellent *MS-DOS and PC-DOS User's Guide* by Peter Norton (Brady Communications; $17.95) have I been able to decipher the instructions written by engineers (apparently for other engineers).

And what I learned is that there are ways to automate many of the standard daily routines that computer users go through—such as making backups of important data or loading several programs into memory all at once, or switching between two programs. Instead of hand-cranking your computer to get it working for you, you can turn the key once and sit back while the car warms up.

On the Leading Edge Model D and all other IBM-compatible computers, you can link a series of DOS commands together into one file, called a "batch" file. Even if there are 10 DOS commands in this file, all you have to do to invoke them is type the name of the file. Thus, depending on the situation, 100 keystrokes or more can be cut to as few as two.

(Note: Apple II users can do the same thing with the EXEC command, but since Apple IIs generally have less memory than most IBM PCs and don't require a heavy use of DOS commands, there's less need for batch files.)

By writing short batch files and giving them names you will remember (such as DOTHIS or WRITE), you are, in effect, making up your own DOS commands. In the future, when you want to load a word processor, you just type WRITE.

Anything you do in DOS that is performed often and requires a number of keystrokes is a candidate for a batch file. The amount of time and routine keytapping you'll save will be significant. And batch files are exquisitely simple to create.

HANDS-ON

Before you start creating your own batch files, there are two things to be aware of. First, make backup copies of your program disks and put away the originals. Second, there are two ways of formatting disks—with and without DOS.

On those disks that will hold copies of your programs, I recommend including DOS. That way, you'll be able to load the program from scratch without loading DOS from a separate disk first. These disks are called "system-formatted." Don't bother to system-format data disks because the system files take up valuable space on the disk.

System-Formatted Disks. Use the CHKDSK command to check for "hidden system files" and the DIR command to see if there's a file called COMMAND.COM on your disk. If you've got both, chances are the disk is system-formatted. Thus, you can just copy the program onto a formatted blank disk using DISKCOPY and DISKCOMP.

If the program disk is not system-formatted, type the following command (on a two-drive system) when you format a blank disk: FORMAT B: /S. Then just copy the program onto that blank disk, which is now system-formatted.

Now you're ready to create a few simple batch files that will make your life easier. Unless otherwise noted, all these examples assume an IBM-compatible system with two floppy disk drives.

Add DOS Commands to Your Program Disks. This batch file will tell your computer to automatically copy certain essential commands from the DOS disk onto your program disks. You can then accomplish routine chores (DISKCOPY, FORMAT, etc.) without having to insert the DOS disk again. Otherwise, if you want to make a backup copy of a data disk or format a new data disk, you'll have to insert the DOS disk again. And in this day and age, who wants to swap disks all day?

You can name the file anything you want (no more than eight characters), as long as it ends in .BAT. Give it a name you'll remember easily. (I call mine SHOE.BAT). Place a working copy of your DOS disk in the A drive and at the A> prompt type:

```
EDLIN SHOE.BAT
```

You'll get the response

```
NEW FILE
*
```

ILLUSTRATION BY NICK JAINSCHIGG

R. STEPHEN BLOCH, *who lives in Norfolk, Virginia, with his wife, is a lawyer by training and a naval officer by profession. He is also a sailor who has published several articles about sailing; this is his first article about computing.*

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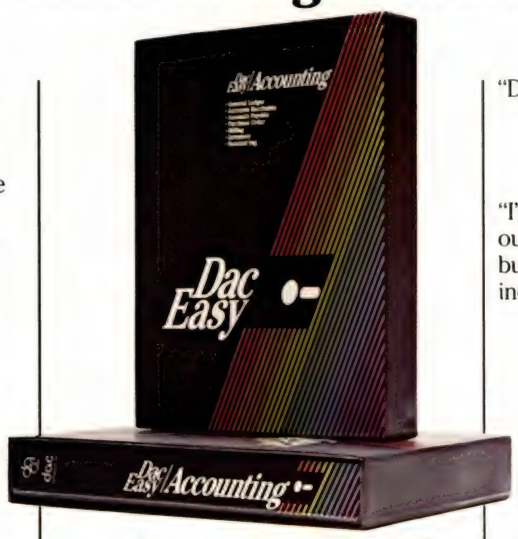

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Just after the *, type an I for Insert, and then press RETURN (or ENTER). After you get the prompt 1:, you should type the following, hitting RETURN after each line (the line numbers advance automatically):

```
1: COPY A:CHKDSK.COM B:
2: COPY A:EDLIN.COM B:
3: COPY A:FORMAT.COM B:
4: COPY A:DISKCOPY.COM B:
5: COPY A:DISKCOMP.COM B:
6: COPY A:PRINT.COM B:
7: ^C
```

When you finish (with a CONTROL-C), you'll get another * prompt. Type E, for exit, press RETURN, and you're through.

Henceforth, merely by placing your DOS disk in the A drive and a program disk in the B drive and typing SHOE at the A> prompt (you don't have to type the .BAT part of the filename), these essential DOS commands will be automatically copied onto the program disk. If there are other DOS commands you're likely to use often, just place the corresponding .COM file names in the batch file. However, be aware that large programs may not have room for too many DOS commands.

Shorten Program Names. If you use and switch between two or more programs, you have to type the name of the program at the system prompt (A>) to load the program. A program like *PC-Write* can be loaded by typing ED, which is no big chore.

However, some programs have longer titles, such as SOFTCALL for *Softcall*. Type this several times a day, and you pray for more concise code names. Fortunately, you can make them up yourself, with a batch file, like this:

```
EDLIN S.BAT
NEW FILE
*I
   1: softcall
   2: ^C
*E
```

Now, at the system prompt A>, just type S and RETURN, and you load SOFTCALL. You save seven keystrokes.

If you use a hard-disk drive, you may be able to save even more keystrokes because you often have to switch directories before loading the program. To use the *Leading Edge Word Processor*, for instance, you switch to its directory (CD\LEWP) and then you type LE C C. Including two RETURNs, that's 15 keystrokes. But you can combine them into a batch file with a one-letter name:

```
EDLIN W.BAT
*I
   1. CD\LEWP
   2. LE C C
   3. ^C
*E
```

At the system prompt type W and RETURN (two keystrokes!) and the program will load.

Automatic Starting. You probably use the same program(s) almost every time you start your computer. What if you could load them all just by turning the computer on rather than manually performing the task? You could make a phone call, check sports scores, or enjoy coffee while your computer prepares for the conductor's (your) entrance.

You orchestrate this magic by creating a file called AUTOEXEC.BAT, a specially-named batch file that MS-DOS computers look for when turned on.

If such a file exists, it will be executed. As all batch files do, AUTOEXEC files contain one or more commands that tell the computer to do the work you used to perform when booting.

Place a system-formatted program or DOS disk in the A drive, and use EDLIN as follows:

```
EDLIN AUTOEXEC.BAT
NEW FILE
*I
   1: PROGRAM NAME
   2: ^C
*E
```

That's all there is to it. From now on you have an AUTOEXEC file on disk, and it will automatically load your standard program every time you turn the computer on. You don't even have to type AUTOEXEC.

If you use RAM-resident programs such as *Sidekick*, you can add them to the batch file. If you want to check your disk or hard-disk for bad sectors before you start working, you can add a CHKDSK command to the file. You can tell the computer to do virtually anything.

Isn't this nice? The computer that is so good at "remembering" all your data has now finally learned to "remember" your peculiar habits.

Make A Custom Menu. Here's one for those who have hard-disk drives full of programs and who hate dealing with DOS. You can create a menu with A, B, and C choices that will show up on your screen every time you turn the computer on! You can use batch files to do this very easily. Start by designing a menu that fits your workstyle. You can even give it a title as follows:

```
CHOOSE NOW OR FOREVER
HOLD YOUR  PEACE

A. WORD PROCESSOR
B. CHECK ELECTRONIC MAIL
C. SPREADSHEET
D. PING PONG GAME
E. MAKE BACKUP COPY
F. SYSTEM-FORMAT NEW DISK
```

Enter EDLIN MENU.TXT at the DOS prompt and type in your menu line by line. Then write six batch files—called A.BAT, B.BAT, C.BAT, D.BAT, E.BAT, and F.BAT—that accomplish the given task (you know how to do that now!). Then write an AUTOEXEC.BAT file that has TYPE MENU.TXT as its last (or only) line so that it will show up when you turn the computer on. When you choose A from the menu, you are actually running the A.BAT file, but who knows that—or cares! This just proves that the best things in life are free and simple. FC

WRITING A BATCH FILE

A batch file can be very simple (like some presented here) or very complicated (including IF statements), but in either case, it's an ASCII "text" file that can be created in several ways. And all of them are quite easy.

You can use the EDLIN line editor, as do the examples here. At the A> prompt, type EDLIN FILENAME.BAT., and it will prompt you for line 1:, 2:, etc. Finish with CONTROL-C, E, and RETURN. Or, you can use the COPY command in DOS, which allows you to type text on the screen whether it is a short note or a batch file. At the A> or C> prompt, just type COPY CON:FILENAME.BAT on one line, hit RETURN, and enter each line of the batch file without numbers. Finish by pressing F6 (Function Key 6) or CONTROL-Z and RETURN.

After using either of these methods, check your work by entering TYPE FILENAME.BAT and press RETURN.

Finally, you can write a batch file with most word-processing programs. Assign a filename, then write the various DOS commands on their own lines without numbers. Save it in ASCII format.

However you type in the file, be sure to give it a name with a BAT extension, such as DOTHIS.BAT. This tells the computer that it's a batch file to be executed. To execute, you need only type DOTHIS. As far as the computer is concerned, DOTHIS is a normal—but very powerful—DOS command.

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PERSONAL FINANCE

SPREADSHEET TEMPLATES: What Are They and How Can You Use Them?

BY EDWARD J. STONE

Spreadsheets are great for organizing and streamlining just about anything in your life that involves numbers, particularly money. You can sit down at your computer, for instance, and list your checks on a spreadsheet the same way that you enter them in your checkbook. You would do this by setting up a spreadsheet model composed of separate columns that record: 1) the date; 2) your checking-account total; 3) each check number; 4) the receiver of each check you write; and 5) the amount of each check. Then you would type in formulas that tell the spreadsheet to add up all of the amounts recorded, subtract that total from the amount of money in your checking account, and display how much money you have left.

Once you've created this spreadsheet model for balancing your checkbook, you could SAVE it on a disk and use it with your spreadsheet program whenever you'd like, so you can enter new checking information and recalculate your balance. This permanent spreadsheet model that you've set up is called a template.

Of course, templates can get much more complex than the checkbook balancer described above. If you have the expertise, you can design a template that's a mirror image of your annual tax return. You can then change figures—such as your gross income or number of dependents—and watch the template automatically recalculate everything.

SPREADSHEETS MADE SIMPLER

As you probably know, you don't have to set up spreadsheet models yourself. For popular programs, including *1-2-3* (Lotus Development Corp.), *AppleWorks* (Apple Computer), *SuperCalc3* (Computer Associates), and others, you can buy prewritten, off-the-shelf templates

that are customized for specific tasks. These templates make the manipulation of a spreadsheet for a particular application, such as checkbook balancing, much simpler. There are also templates that can help you stay on budget, reduce your taxes, organize your home business, and more.

Templates are usually easy to learn and use, since you should already be familiar with your spreadsheet program. To use a template, you must own the spreadsheet program the template was designed for. You boot your spreadsheet and simply load in the template as if it were spreadsheet data you had SAVED to disk. Some templates use the features of advanced spreadsheets like Lotus' *1-2-3* to function almost automatically. Others require a good working knowledge of the spreadsheet they're written for.

As already mentioned, you can design your own templates from scratch. But for many applications, why bother? These prewritten models spare you the time, drudgery, and frustration of trying to design your own templates. They also let you tap other people's financial expertise in an inexpensive way.

Although there are countless spreadsheet templates on the market, most are for Lotus' *1-2-3* and are available only via mail order, from vendors, or from the people who wrote them. Therefore, finding the right ones isn't always easy. Look through the advertisements in some of the popular computer and/or business publications. There are also public-domain templates available for free or at a nominal cost from user groups. One source is the New York Lotus User Group Software Library in Brooklyn, New York.

Let's take a closer look at the templates available and what they can do for you.

CHECKS AND BALANCES

Good home checking and budgeting templates can help you fight the monthly blizzard of checks, bills, and credit-card receipts.

If you'd like to keep better tabs on your cash flow, you should consider one of these templates. If you take the time to update the information, they will let you keep information about your financial status at your fingertips. Then you can set financial goals for your family—and reach them.

Just Keepin' Records ($35), published by Hershell L. Heath of Oklahoma City, Oklahoma, is an example of a Lotus' *1-2-3* template that can help put your financial house in order. It is both an electronic checkbook and a budgeting template. It tracks your checks, sorts them in various ways, and compares what you spend with budget totals for each "account" you set up. For example, you might want to set up one

EDWARD J. STONE *is a writer and consultant. In his spare time, he enjoys drawing cartoons, writing poetry, and playing with spreadsheet templates.*

ILLUSTRATION BY STEVE PARTON

IBM VERSIONS INTERFACE WITH LOTUS 1-2-3

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**Volume 1 only

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Checkbook & Shoestring Accounting ($35), from Audi Electric of Fremont, California, also requires Lotus' *1-2-3*. It's probably most appropriate for families who run their own businesses or who have a lot of financial information to track. This template writes checks for you and lets you assign numbered "account codes" to checks. For example, you could assign a special account code to all of the checks you write for your car payments. At the end of the year, the program can add up all of those checks, obviously a great help when you do your income taxes. The budget-conscious will like the way this template can summarize your expenses by account, on a monthly, quarterly, annual, or other basis. This makes it easy to find out how you're actually spending your hard-earned dollars—and whether you're sticking to the budget you so carefully laid out.

CAN YOU SPARE A DIME?

Templates can also help you when you want to take out a loan—whether it's a college loan, home-improvement loan, car loan, or mortgage. There are templates that will customize your spreadsheet to help you judge if you can really afford a loan. *Loan Scheduler* ($40), for Lotus' *1-2-3* and published by AVS Development of Cypress, Texas, will build a payment schedule that lets you see exactly what your payments will be for a loan. It lists principal payment, balance, and interest payment and also tells you the total interest you have paid each year. The same firm also offers a more advanced *Loan/Mortgage Calculator* ($40) that will let you compare mortgages. Now that loan interest rates have been dropping, it may pay for you to scrap your old high-interest rate mortgage in favor of a new, lower-interest rate mortgage.

COUNT YOUR PENNIES

If you're running a small business out of your home, or even thinking about it, you'll probably want some kind of electronic accounting system. An accounting system is simply an organized way to record, classify, summarize, and report financial transactions. It makes it easier for you to know where your money is coming from and where it goes.

If you use a spreadsheet along with an accounting template, your computer can record transactions and recalculate your finances much faster than a bookkeeper can. Entries aren't totaled manually and the risk of making mathematical errors is reduced. A good template will automatically keep your money transactions in a general ledger, a cumulative monthly record of transactions. Many accounting templates can also draw up reports and financial statements based on the recorded accounting information.

Accounting systems keep track of who owes you money and how much they owe (accounts receivable), to whom you owe money and how much you owe (accounts payable), and what items you have in stock (inventory). In addition, they can track money paid to employees (payroll). All of these functions are available in templates such as *Ready-To-Run General Ledger* ($70), for Lotus' *1-2-3*, by Manusoft Corporation of Culver City, California. Manusoft also offers other modestly priced programs or modules that work with this accounting template. These include accounts payable, accounts receivable, inventory, and payroll modules.

A template accounting system won't begin to give you all of the accounting expertise you'll need—so don't fire your accountant. But if you use it wisely, it can help you get a handle on how your business is doing and save you a lot of time.

TAXING TIMES

There are also spreadsheet templates designed especially for tax preparation and tax planning. The *EasyTax* template for Lotus' *1-2-3*, from Valley Management Consultants of Huntingdon Valley, Pennsylvania, is both a tax preparer and a tax planner. You can try out different alternatives—"what ifs"—and then choose the best course of action.

There's also the realm of "personal financial planning," which goes beyond simple tax planning. One financial-planning template for Lotus' *1-2-3*, *CPS Personal Financial Planner* ($50), from Computerized Pricing Systems of Broomfield, Colorado, is both a federal tax planner and a personal financial planner. However, don't try to use it to file a return with the U.S. Internal Revenue Service. To do that, you'll need a tax-preparation template, such as *TaxAide Plus*, from Software Applications of Wichita, Kansas, and *Taxtime for 1-2-3* ($95-$195), from Austin Scientific of Menlo Park, California. Entering data for tax-preparation templates is often similar to filling out an IRS tax form. Make sure that any tax-planning or preparation templates you buy have been updated to reflect whatever new changes Congress makes. To use these templates most effectively, you should consult your accountant as well. He or she will be able to make sure your spreadsheet has calculated your taxes accurately for your particular circumstances and may also be able to suggest further tax-reducing measures not taken into account by the templates.

TEMPLATE POTPOURRI

Some vendors offer a variety of templates on one disk. *Super Grab Bag* ($12), for example, from Petit Design and Engineering of Milwaukee, Wisconsin, offers a potpourri of templates on one disk for *AppleWorks* or *SuperCalc3* users. These include *Tax Worksheet* for doing your income taxes and *Tax Ledger* for listing deductible checks and charges. You'll also find a pair of real-estate templates, one that helps potential home owners estimate what they can afford and another that compares different homes or financing plans on one home. Another template on the disk is a college-fund calculator. It estimates the four-year cost of educating a child at either a public or private college—given the child's age—and shows how much of this cost you can cover by putting away money each month into a college savings fund.

Success With AppleWorks ($30), from hotCider of Peterborough, New Hampshire, includes 10 templates for *AppleWorks* for a wide range of needs including planning a home or business budget, preparing an annual-expense summary, and figuring a loan amortization. And a template from Apropos Software, available for the publisher's *MoneyWorks* spreadsheet, is designed to help evaluate the costs of planning for college, buying a home compared to renting, and buying versus leasing an automobile.

Spreadsheet template models can be powerful tools for taking charge of your finances. If you want to keep your home budget or checkbook on your spreadsheet, why not make the task easier by using a template? Eventually, you may even be writing and selling your own templates.

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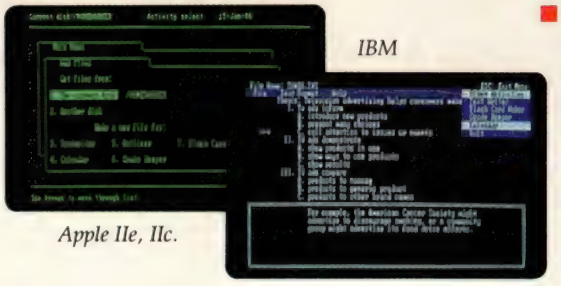

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Apple IIe, IIc.

- *Flash Card Maker* assists with memorization tasks. You can create flash cards to test your knowledge on the screen, or print them out to study away from the computer.
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- *Grade Keeper* allows you to project and record your grades. See how an individual grade might affect your final grade. Grade Keeper also computes your G.P.A.
- *Calculator* helps with computations and conversions. It performs the basic functions of a pocket calculator and has multiple memory locations. Conversion tables make it easy to change from one unit of measure to another.

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CIRCLE READER SERVICE 16

ENTERTAINMENT

18 TIPS AND TECHNIQUES FOR WINNING AT ROLE-PLAYING ADVENTURES

BY JAMES DELSON

I've got a secret. Or, should I say, the games I play do. That's why I don't begin to win until I crack the secrets of a game's play system and finally understand what makes it tick. That's when I discover tricks that remove or equalize many of my opponent's advantages. This is important, because, like most folks who play games on computers, I need all the help I can get—especially with the labyrinth of details that make up a role-playing adventure.

Since the appearance of *Wizardry* in 1981—and continuing with such quests as Lord British's *Ultima* series—role-playing and multicharacter fantasy-adventure programs have been incredibly popular. They require you to use imagination in creating characters such as hobbit thieves, dwarf fighters, and human mages (a type of magician). You'll have to discover ways to increase your character's experience points for attributes such as intelligence and strength—or you won't survive. And if you don't have a working knowledge of resource management, you'll need to develop one to succeed. Knowing how hard role-playing adventures are to crack, I'd like to share some of my treasured techniques with you as you continue on your own quests.

JAMES DELSON, *entertainment software reviewer for* FAMILY COMPUTING, *is looking for that one trick that will solve every game.*

SIX TIPS FOR ALL ROLE-PLAYING ADVENTURES

1. Build multiple mages, priests, and other major magic users, until they make up half of your party's numbers. They take much longer to mature (reach full power) than ordinary characters such as fighters, but they're far stronger in the long run.

Mages, for instance, can generally cast spells which will: a) affect enemy groups, not just single characters; b) cause far more harm to single characters than your strongest individual fighters; and c) perform such services as teleporting the entire party from town to town or from level to level in dungeons.

2. To best develop your mages and priests, look for the specific spells that will prove most useful for the entire party. Remember, though: just as abilities will vary from game to game, spell usage is also not a constant. In general, though, priests should strive to get the resurrect spell as soon as possible, while mages should try for a spell that will inflict the most damage on a group of enemies. Therefore, in those games that let you assign percentages of newly acquired experience points to specific characters, always give the lion's share of points to

ILLUSTRATION BY BRAD HAMANN

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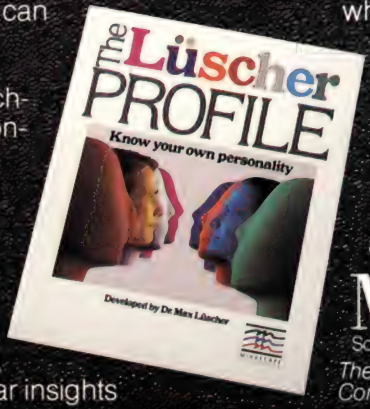

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your chief mage first, followed by the leading priest. This way, they'll help the rest of the party instead of waiting for the others to protect them.

3. Learn to draw maps. If you hope to enter and exit mazes alive without this skill, you're fooling yourself. Start with graph paper and use simple symbols to mark where you've been. Doors, hidden doors, walls, stairs, chutes, traps, and so on are usually revealed. As you play a while, you'll learn to recognize them, mark them on your map, and use, avoid, enter, or exit through them.

4. Move only one step at a time during your first trip through a maze, so you can mark each space on your map. If you believe you're lost, cast a spell to determine your location. But be careful! When you have no spells, you'll need to spend all your remaining time and energy trying to find a way out.

5. Each role-playing adventure requires higher-level characters to accomplish the difficult tasks at hand. You can either let your characters develop slowly, by exploring and trying to stay alive, or you can do what my playtesters and I call "walking around the castle." That is, finding a place in the early dungeon levels of a game where you can fight monsters with a certainty of killing them while staying alive yourself. There is an advantage to gaining your experience points this way: You can usually advance your characters more rapidly than if you patiently accumulated hit, spell, and experience points. This trick also lets you learn which weapons and spells to use and helps you gain mapmaking experience with little risk of getting lost.

6. A basic technique: Learn all your spells. While some may appear useless, each was created with a purpose. In most cases, if a character can use a spell instead of fighting hand to hand combat, do so. Of course, you first need to consider questions such as: How far are you from an exit? (Always save some spell points to get out alive.) Is your spell powerful enough or your spellcaster skilled enough to hurt the monster?

12 TRICKS FOR NINE GAMES, ALL FULLY TESTED

Ultima Series (III, IV)

1. Whenever possible, obtain ships to transport your fledgling characters around the map. Ships are quicker than walking. They're great for getaways (try landing on a coast, raiding, and beating a hasty retreat if the monsters are too strong). They're also easy to defend from monsters because there are only two gangplanks where you can concentrate your forces.

Wizardry Series

(Proving Grounds of the Mad Overlord, Knight of Diamonds, Legacy of Llylgamyn)

2. As soon as you're able, turn your eligible characters into bishops. They are the ultimate warriors in this series, capable of casting all spells.

3. Once a character becomes a bishop, identify everything in sight. For a treat, identify item #9 sometime (send us 10%). Also, try identifying items "S" and "J."

Phantasie Series (I, II)

4. Whenever you find magic and healing potions, purchase as many as you can afford and your party can carry. By rationing supplies carefully, you can extend the time between "recharges" in towns.

5. Build up your primary mage first. Give him x3 experience when you arrive in town each time, and everyone else x1. Then get the teleport spell. Use it to visit higher numbered towns, where it costs less to achieve higher levels in guilds, the armor shops usually carry better weapons, and the surrounding countryside is filled with more valuable monsters to fight.

Wizard's Crown

6. In developing your characters, drop the least valuable ones as soon as possible. Replace them with combination beings such as a mage/priest/fighter/ranger. It will take many hours to develop into a full-fledged character, but when fully grown, it's awesome!

7. As you create your characters, don't waste anything on experience. Instead, spend your points on life (at least 45 points to survive exposure to poison), intelligence, and dexterity. Then, as you develop your character through fighting, save up every third set of 100 points to buy extra strength, which gives you better armor and weapons.

8. When you acquire the points to begin surprising opponents, don't let the bad guys come to you. It's better to place your best fighters alongside the enemy magic users; when you attack, you can eliminate them first. Once you're facing only warriors—no matter how strong they are—you can employ spells to blow them away (fireballs are especially effective).

9. When looting from the vanquished after each battle, be choosy. Take only the best items, and then sell them at the town square. Here's where haggling really counts.

10. If you're able, mix up a number of "create terrain" spells and have each of your characters carry one or two of them. Then, when you cannot avoid a fight, nor escape off the map, "build" a fort of solid blocks. That's where your party can find shelter, leaving one or two doors open so you can fight the monsters. Beware of enemy magicians, however, as their magic can penetrate walls.

Seven Cities of Gold

11. Never attack the Indians unless you absolutely have to! This means walking into villages very slowly and pausing whenever the drums begin to beat faster. You should buy off the Indians with gifts rather than fighting; pay for the chief's assistance instead of forcing the issue.

12. Leave caches of supplies behind as you head into unknown territories. Draw an area map that shows where the caches are so you can find them later.

EDITOR'S NOTE: *Join us next month as we continue with more techniques for winning with computer games.* FC

SOFTWARE INFORMATION

Phantasie Series (I, II). Strategic Simulations, Inc., (415) 964-1353. Apple, C 64/128, Atari, Atari 520ST, Macintosh (I only). $40.

Seven Cities of Gold. Electronic Arts, (415) 571-7171. 64K Apple, Amiga, Atari, C 64/128, IBM PC/PC*jr*. $15-$40.

Ultima Series (III, IV). Origin Systems, (603) 644-3360. Apple, Atari, C 64/128, IBM PC/PC*jr*. $50-$60.

Wizardry Series (*Proving Grounds of the Mad Overlord, Knight of Diamonds, Legacy of Llylgamyn*). Sir-tech Software, Inc., (315) 393-6633. Apple, IBM PC/PC*jr*, Macintosh (*Proving Grounds* only). $35-$60.

Wizard's Crown. Strategic Simulations, Inc., (415) 964-1353. Apple, Atari, C 64/128. $40.

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Captain's Log... War Date 10.01.44

"Captain's Log, October 1, 1944. 0250 Hours. Fleet submarine USS Hammerhead proceeding Southwest at cruising speed. Our mission: intercept enemy convoy off the coast of Borneo. Disperse and destroy."

"0300 Hours. Two hours until dawn. Radar picks up convoy, escorted by two destroyers. We believe that one of the enemy's valuable cargo ships is part of convoy formation."

"0400 Hours. Lookouts on the bridge. Target identification party reports one cargo ship, 4,000 tons, troopship of 10,250 tons, with two *Kaibokan*-type escorts. Moving into attack position."

Tandy 1000/IBM PC Jr screens shown

"0500 Hours. Sound General Quarters! Battle stations manned. Preparing for torpedo run. Gauge Panel OK. Periscope OK. Charts and Attack Plot Board OK. All mechanical systems OK."

"0525 Hours. Torpedo rooms report full tubes forward and aft. Battery at full charge for silent running. We hope water temperature will provide thermal barrier to confuse enemy sonar."

"0600 Hours. We are at final attack position. Convoy moving at 10 knots. Target distance decreasing rapidly... Crash Dive! Escorts have spotted us and are turning to attack! Rig to run silent."

"0700 Hours. Depth charged for one hour. Some minor damage, but repair parties at work. Destroyer propeller noises receding. We'll come to periscope depth for our return punch."

"0715 Hours. Torpedo tubes 1, 2, 3 fired. Two destroyers hit and sinking. One of the enemy's last cargo ships coming into 'scope view — an ideal target position. On my mark... Fire Tube 4! Fire 5!"

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CIRCLE READER SERVICE 33

TELECOMPUTING

GIVE PRINT A CHANCE

The Reading's So-So, But Some Books About Communications Are Great Reference Guides

BY NICK SULLIVAN

Strange sounds, strange sights—that's what I got when I first connected a modem to a computer and tried to make a phone call. I didn't know whether the problem lay with the modem, the software, the serial card (on an Apple IIe), the telephone lines—or me. So I went to the store that had sold me the modem.

Big waste of time. They said, in effect, "Insert tab A in slot B," which I had done already. I had no choice but to turn to books—a very difficult task for someone just getting used to the immediacy and interactivity of computers.

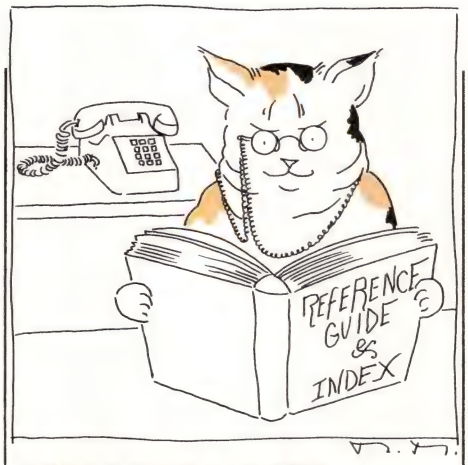
A few years ago, most books on the topic were written by engineers who had been weaned on mainframe communications in the fifties and sixties, not Commodore 64s and Hayes modems in the eighties. As ancient lore goes, the books have much less spark than Livy's *History of Rome*.

But I plowed through, and tried to piece together a likely scenario for making a simple phone call. I took notes, made diagrams, and begged strangers for the missing piece of the puzzle. Ah, but the man who had barely fulfilled science requirements in high school and college was ill equipped to decipher serious technical tomes. So I turned to trouble-shooting—the car buff's ancient remedy—and started switching parts to isolate the potential culprit.

The culprit was quickly apprehended. It was the serial card. The new one worked, I reread the manuals that came with the modem and software, and before I knew it I was running up ghastly phone bills.

I immediately swore off books. Why had they not told me it was easy and that I didn't have to know how the telephone system worked to make a phone call? Swine!

Senior editor NICK SULLIVAN, *who has failed on five occasions to finish* Moby Dick *and is now reading* Deep In the Heart of Borneo *(a minor jungle classic), has read some of the world's most boring books—and lived to recount his adventures.*



YEARS LATER, A FEW HUMBLE POINTERS

Time being a healer and all that rubbish, I'm back on books. I started picking them up here and there (not in dentists' offices), and here and there finding nuggets of information. I don't read these books *per se*, but I use them as reference guides. The secret is knowing which book to turn to, and when. And knowing what to expect from books in the first place.

1. Books about computers are by definition going to be out of date when you buy them. Change in the computer industry is rapid, and the book publication process is slow. However, if you don't take everything you read as the gospel truth, you'll still find much useful material.

2. Books about communications that tell you how to do something "in general terms" are of dubious value. These books usually make computer communications seem more difficult than they really are. People who have a good grounding in a subject can use these books to add to their knowledge or "brush up." Others may like the "overview" of the field. But, most people, especially novices, will find the answers to their system-specific questions in the product documentation. Even if the language is somewhat obscure, at least it's about your system.

3. Never buy a book you intend to use as a reference guide, unless it has a very good index. To make an in-store test, pick a topic, thumb through the back pages, and see if the index directs you to the right spot.

Indexes that make cross-references to the same topic are helpful. Ideally, you'd want to find the salient facts on file-transfer protocols by looking up FILES, PROTOCOLS, or TRANSFER. You don't want to have to outguess the indexer.

Second, indexes that list endless page numbers (e.g., GAMES: 1-3, 27,28, 49-70, etc.) for one subject are confusing. Rather, the subject should be broken down into subcategories (e.g., GAMES: ADVENTURE 21,22, ASTROLOGY 38, BLACKJACK 41, etc.).

HOW-TO BOOKS

Having just admonished readers not to trust "general" books, let's thumb through two that have risen like cream.

Dialing For Data: A Consumer's How-To Handbook on Computer Communications (David Chandler, Random House, New York, 1984; $9.95) provides pleasant reading. Like all good technical books, it teaches and informs gently, so that you don't know you're being taught or informed.

In style, the book is reminiscent of *The Personal Computer Book* (Quantum Press, Doubleday, New York, 1984; $9.95), the Peter McWilliams computer classic with droll woodcuts and natural laughs. Chandler, a Pulitzer-Prize winner and *People* magazine correspondent, walks along with you chapter by chapter: "What's Out There," "Basic Information," "The Hardware," "Modems and Software," "Computer Choices," "Buyer Beware," "The First Call," etc. Snappy sidebars complete the fine presentation.

Dialing for Data is neither a reference guide, nor a guide to making your specific system work. And much of the information on computers and electronic services is dated. But as a general, accessible introduction to electronic information and what you can do with it (e.g., save money, make money, develop

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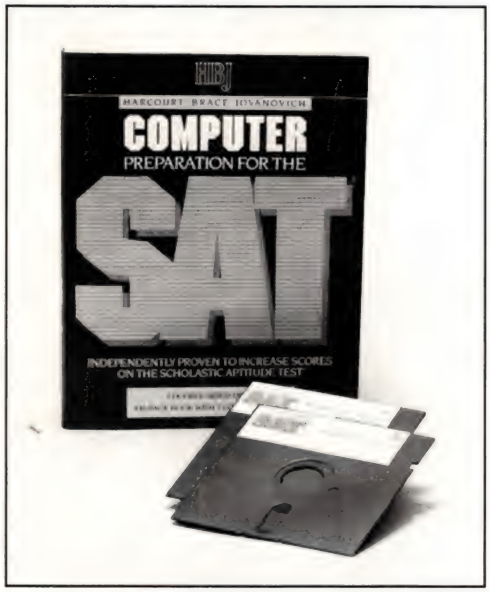

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CIRCLE READER SERVICE 20

TELECOMPUTING

new interests and friends), *Dialing For Data* makes the big picture clear enough to see your own reflection.

SYSTEM-SPECIFIC BOOKS

The standout in this relatively small field is *How To Get the Most Out of CompuServe*, now in its second edition (Charles Bowen and David Peyton, Bantam, New York, 1986; $16.95; includes $6 credit from CompuServe). Ignore some of the cute stuff (e.g., "How is CompuServe like a restaurant? Both are menu-driven.") and you have a clear blueprint of this labyrinthine information service.

Who's the book good for? New CompuServe subscribers who want to learn their way around without running up a big bill. A good index will direct you to the right page quickly, so you can use it when online. And experienced users who want to explore new parts of CompuServe can find out what else is available without taking an expensive cruise to nowhere.

The same authors and publisher have also released *How to Get the Most Out of The Source*, still in a first edition ($14.95).

PHONE BOOKS

Once you get a modem working, you want to explore the electronic world. To reach bulletin board systems (BBS's), information services, and the thousands of specialized data bases, you need electronic phone numbers. Fortunately, three good directories have been compiled.

The Omni On-Line Data-base Directory (Owen Davies and Mike Edelhart, Collier Books, New York, 1985; $14.95), updated each year, lists over 1,100 specialized data bases. It includes general hints on how to use data bases more effectively. The first sentence even describes "data base": "an organized collection of facts in computer-readable form."

The meat of the book is the listing of data bases by category. The list covers Advertising and Marketing, Agriculture, Auto Industry, Social Sciences, and Trade and Transportation. For each specific data base (such as NASA Budgetscan, Book Review Index, and Exceptional Child Educational Resources) you'll find: Contents, User's Comment, Access, and Suppliers.

The Computer Phone Book Directory of On-Line Systems (Mark Cane, New American Library, New York and Ontario, 1986; $18.95) fo-

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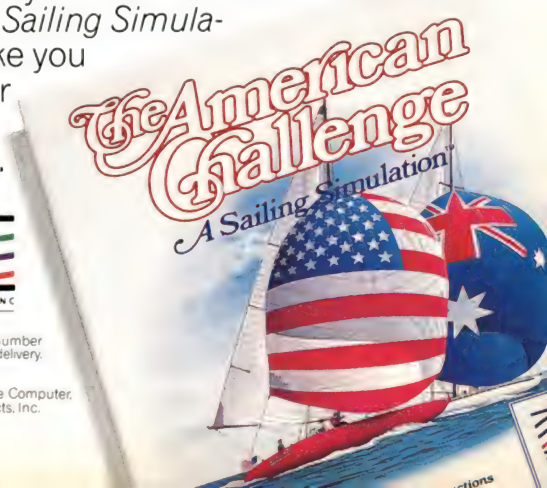

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TELECOMPUTING

cuses on local BBS's around the U.S. and Canada. Author Mike Cane, who dedicates the book to his beloved cat, named "Backspace," warns us that many of the phone numbers may no longer be in service because "the average lifespan of a BBS is three months." At least he's made an effort to list boards that have survived since his first edition in 1983. Nonetheless, be forewarned.

The book is well organized. Bulletin boards are listed by state, so you can check for boards within a reasonable calling distance of your house. Most listings include System Name, Phone Number, Features, Special Interests, Access Requirements, Downloads, Fee, and Comments. In some cases, Cane provides the system's commands or a printout of material you're likely to find.

Infomania (Elizabeth Ferrarini, Houghton Mifflin, Boston, 1985; $14.45), a term made up by the author, is an appropriate title for Ferrarini's second book. The first was *Confessions of an Infomaniac*. You get the idea—Ferrarini (also known as Baud or CosmoGirl) is kind of nutty about information, and she regurgitates a lot of it in this personalized testimonial to the electronic age.

Organized with headings such as Money, Travel, Learning, Careers, and News, *Infomania* presents much of the same information as *The Omni Guide*. It's much chattier, so some may find it livelier reading. On the other hand, the presentation is less consistent, and key facts, such as cost and access, are somewhat hidden.

At the bottom of each page, a short sidebar relating to the main text generally peers into the future. Alongside are juicy quotes about information and related topics from such savants as Oscar Wilde: "It is a very sad thing that nowadays there is so little useless information." Diverting, to say the least, even though it dates to 1896.

GREAT EXPECTATIONS

As in most endeavors (with notable exceptions like surgery), the best way to learn is by doing. Reading books before you start may discourage you from ever starting. Teach yourself how to use a modem first (just go full steam ahead and don't look back), and then build a library based on your needs. You'll buy with discrimination and harbor no great expectations. FC

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La Mesa, CA
Los Angeles, CA
Menlo Park, CA
Montclair, CA
Orange, CA
Pasadena, CA
Pleasant Hill, CA
Rowland Heights, CA
San Diego, CA
San Francisco, CA
Santa Ana, CA
Santa Monica, CA
Sherman Oaks, CA
South Center: Tukwila, WA
Sunnyvale, CA

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Albany, NY
Atlanta, GA
Baltimore, MD
Birmingham, AL
Danbury, CT
Exton, PA
Holyoke, MA
Huntington Station, NY
Kendall, FL
Kenner, LA
King of Prussia, PA
Langhorne, PA
Monroe, LA
North Wales, PA
Rockaway, NJ
Voorhees, NJ
Wayne, NJ
Whitehall, PA
Woodbridge, NJ

FLOPPY JOE'S
Yuma, AZ

GAMES 'N GADGETS
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Baltimore, MD
Burlington, NJ
Clearwater, FL
Cleveland, OH
Columbia, MD
Garden City, NY
Hampton, VA
Jacksonville, FL
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Livingston, NJ
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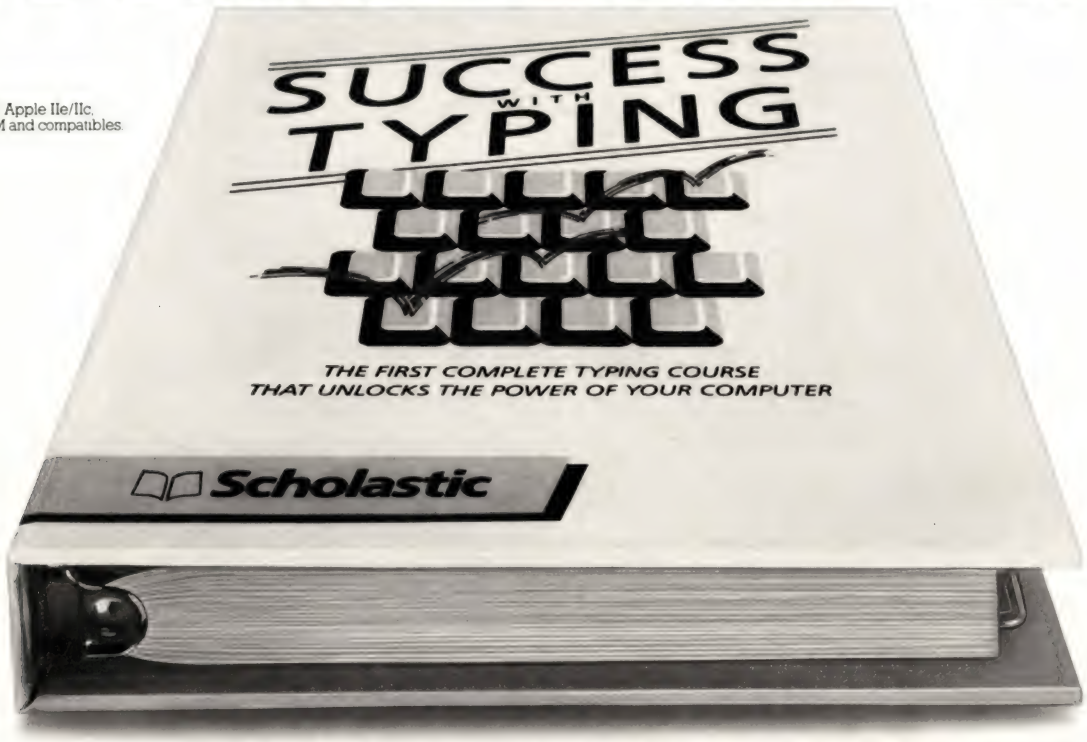

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CIRCLE READER SERVICE 44

MACHINE SPECIFICS

NEWS, OPINIONS, QUOTES, & RUMORS ABOUT YOUR FAVORITE COMPUTER

APPLE

BY CHARLES H. GAJEWAY

Apple's hot news is its IIGS computer (*see feature*), but let's analyze some older news—the Macintosh Plus and various upgrades. I have had the opportunity to work intensively with the Plus, and I like it. The big improvements are the 800K double-sided disk drives, the new, larger ROM-based operating system, 1 megabyte of RAM (expandable to 4 megabytes when megabit RAM chips become available at reasonable prices), a SCSI peripheral port, and the Hierarchical Filer System (HFS). Taken together, these improvements greatly enhance the speed and convenience of working with the Mac, which was slightly slow and underpowered for serious applications.

Is the Mac Plus upgrade worth it? Apple has made a variety of upgrades available, so owners of earlier Macs can incorporate some or all of the Mac Plus features into their machines. The first upgrade includes the expanded ROM and the 800K internal disk drive, and currently retails for $399. This is a reasonable price, especially since it brings the user more than 75% of the Mac Plus features.

The next upgrade (which requires the ROM/disk upgrade) is the new system board, including 1 megabyte of RAM and the SCSI port. This kit is priced at $599 for a 512K Mac or an Apple-upgraded 128K Mac, and $799 for a 128K Mac. The last step is the Mac Plus keyboard, with a built-in numeric keypad and cursor keys, at a suggested retail price of $129.

The full upgrade, therefore, would cost from $1,027 to $1,227, depending on the flavor of your particular system. For most users, however, the system-board upgrade offers little. The 512K machine has adequate memory for most uses, the SCSI peripheral market has not bloomed enough to make the rather steep price of the new system board worthwhile, and the price of the upgrade will drop as third-party competition picks up.

The keyboard upgrade includes a numeric keypad and cursor keys; I think that the additional keys would be necessary only for heavy spreadsheet users.

Whither MacWrite/MacPaint? Two changes on the Plus irritated me. First, Apple is no longer including *MacWrite* and *MacPaint* with the Macintosh. The missing software may not be important to corporate users, but not getting a free word processor is a matter of vital concern for most home users. It also means you can use the computer immediately, without having to shop for software.

Second, the serial port connectors have been changed from the old nine-pin D-connector to an eight-pin DIN-style piece. The new connectors mean that many Macintosh accessories will require new cables, and, worse, the "missing" ninth pin (which carried a five-volt power source) renders some peripherals inoperative. Adapter cables are available for about $20, but I'd rather spend $30–$40 on software or diskettes than cable adapters! (Apple does supply them free with upgrade kits—but not with the Plus itself).

Quote of the Month. "The Macintosh is now being targeted at the consumer market and will sell to homes in large numbers this Christmas." —JOHN SCULLEY, Apple CEO

Contributing editor CHARLES GAJEWAY *works for Merrill Lynch and has owned Apple computers "for years."*

ATARI

BY JOHN ANDERSON

They said it couldn't be done. Atari, seemingly down for the count, was hastily sold by Warner Communications to Jack Tramiel, mogul ex-official at Commodore. Like Iacocca at Chrysler, a man with his work cut out for him. Warehouses full of stock moving very, very slowly. No new machines on the drawing board. Loss of the Amiga machine to Commodore. How could he possibly inspire recovery?

I have owned and written about Atari computers since there were Atari computers (1979). I have written in times of great excitement, and great disappointment. I have witnessed an inspired electronic creativity years ahead of its time. I have witnessed gaffes and blunders that made me want to scream. But all the while I have maintained a loyalty to Atari computers, because of their capabilities. And I am not alone.

***Star Raiders*: Coming Soon To An ST Near You!**

***Star Raiders*, Part I.** Seven years ago, the game *Star Raiders* made a splash that still hasn't subsided. It remains one of the best looking, best playing, real-time space games around. It sold a lot of machines, to me and to many like me. We wanted *Star Raiders* and we wanted to learn to write our own *Star Raiders*. And so we got hooked.

Now we are waiting impatiently for *Star Raiders ST*.

While we wait, I am very happy to report that this is one of the most exciting periods for Atari since the introduction of the original models 400 and 800. The new Atari 520ST and 1040ST are assuming their rightful places in the forefront of a new-generation marketplace. The capabilities of these machines, combined with an incredibly aggressive price point (the 520ST is the only machine based on a 68000 processor that retails for under $500) have broken the market wide open.

Since the beginning of the year, over 300 new ST software titles have been shipped from third-party developers. Software is available in the

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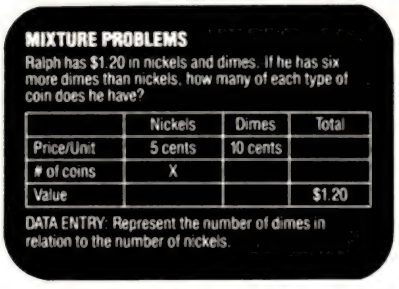
MIXTURE PROBLEMS
Ralph has $1.20 in nickels and dimes. If he has six more dimes than nickels, how many of each type of coin does he have?
Nickels | Dimes | Total
Price/Unit | 5 cents | 10 cents |
# of coins | X |
Value | | | $1.20
DATA ENTRY: Represent the number of dimes in relation to the number of nickels.

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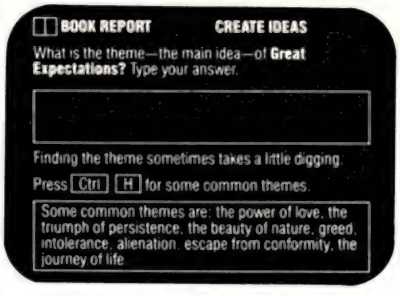
MATH WORD PROBLEMS helps the student translate word problems into workable equations. A step-by-step tutorial uses a unique grid system for breaking word problems into manageable parts. And it shows students how any math word problem can be analyzed in a methodical way. There's even a built-in algebra calculator that removes the drudgery of doing tiresome calculations.

WRITING


BOOK REPORT
CREATE IDEAS
What is the theme—the main idea—of Great Expectations? Type your answer.
Finding the theme sometimes takes a little digging.
Press Ctrl H for some common themes.
Some common themes are: the power of love, the triumph of persistence, the beauty of nature, greed, intolerance, alienation, escape from conformity, the journey of life

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areas of education, music, personal finance, programming, and entertainment.

***Star Raiders*, Part II.** Atari has also announced its own software products for the ST, including the *DB Master One* database; *DB Man*, an extremely powerful relational database; *1st Word*, for advanced word-processing; several mainframe terminal emulators; and several arcade game adaptations including *Star Raiders ST!*

The impressive *ST Software Catalog*, which contains over 300 pages full of descriptions of the hundreds of available ST titles, can be had for $9.95. Call Atari at (408) 745-2000.

As for hardware, the schedule is moving a bit more slowly. The hard-disk drive is late, and there's no sign of the CD-ROM drive that Atari has promised for months now. Hard drives from 10 megabytes to 60 megabytes are available from the Supra Corp., but we're waiting to compare them against an Atari product.

Rumor of the Month. Atari is working on a 5.25-inch disk drive for the ST computers that will run MS-DOS. Keep your eyes open, but don't hold your breath.

JOHN ANDERSON, *previously an editor at* Creative Computing, *is now an editor at* Computer Shopper *magazine.*

COMMODORE

BY SHAY ADDAMS

Commodore 64C: A better mousetrap?

When the C 64 refused to fade away gracefully like a good soldier should, Commodore issued it a new uniform and marched it back into battle. The C 64C is basically the same computer in a sleek new case, styled after the C 128. However, the C 64C is sold with an arsenal of software.

Most notable is the GEOS "windows-and-icons" operating system, which should be more inviting for novice users than having to type LOAD XXX, 8, 1—the old 64 method.

Also included are *geoWrite* and *geoPaint*, educational programs, and communications software for QuantumLink, the Commodore-only telecommunications network. All work under this new operating system. (Q-Link's chief attraction may prove to be *Habitat*, an animated, multiplayer adventure from Lucasfilms Ltd. More on that in future months.) More GEOS software is supposed to be on the way from third parties.

The C 64C is priced "under $250" (more like $200 at discount stores), but that price does not include a modem ($60) or mouse ($50). And to take full advantage of GEOS, you'll need a mouse.

Though the price may attract first-time buyers, longtime C 64 users will find the C 128 a better upgrade deal than the C 64C because there's better software available. And application software's text and data look better in an 80-column monochrome display, an option with the C 128 and 1802 monitor.

C 128 Software. Most C 128 games run in the 64 mode. But the majority of C 64 applications—*Fleet System 2*, *Wordpro*, *PaperBack Writer*, and *Oracle* are typical of the quality C 64 word processors and data bases now available—have been rewritten for the 128's fast mode. And someone out there obviously thinks the 128 is finding a niche in small businesses. Witness the slew of accounting software, such as Softsync's *Accountant, Inc.*

There's plenty of exotic stuff that works on both the C 64 and C 128, like Abacus Software's *Cadpak*, a CAD/CAM program, and *Chartpak* for creating charts and graphs with *Multiplan* and *CalcResult* data. Lots of language options are cropping up, from *Super C Compiler* (Abacus) to *128 Forth* (M & M; C 128 only). Hardcore programmers can find an array of assembly language editors and related utilities. The *Rebel* assembler (Nu-Age) works with the C 64 as well.

Commodore has released *MicroIllustrator* for the C 128, a professional graphics package that holds six pictures in memory at once. CP/M software is unexpectedly turning into a major trend as more existing programs—many of them public domain—are found to run unmodified in the 128's CP/M mode. The First Osborne Group (P.O. Box 3474, Daly City, CA 94015) has disk-based catalogs of such titles.

Amiga. More software is also materializing for the Amiga. Electronic Arts' *DeluxePrint* lets you mix text with *DeluxePaint* graphics, move them around and print the results in 16-color graphics. You might print them on Canon's new ink-jet printer (PJ-1080A, $699), which is Amiga-compatible. Batteries Included has adapted *PaperClip*, originally a C 64 word processor, for the Amiga. It has a real-time spell-checker and an "idea processor" that helps you make outlines prior to writing.

SHAY ADDAMS *is editor of* Questbusters, *a monthly newsletter on adventure games.*

IBM

BY PHIL WISWELL

IBM Convertible with a special monitor.

The biggest news of late from Big Blue (besides continuing price cuts) is the Convertible, a portable computer that leaves many users wondering: "Why would I want one?"

Let's consider the facts. The $1,995 Convertible weighs about 12 pounds. You can tote it easily but it's a bit heavy to hold on your lap. The 12-by-15-inch case packs 256K RAM, expandable to 512K (at a hefty $1.40 per K), plus a pair of 3.5-inch disk drives. It's the first IBM computer to use 3.5-inch disk drives in this country; the IBM JX, marketed first in Japan, and now in Australia, also uses these drives.

These smaller disks are sturdier and can store twice the data (720K) of 5.25-inch disks, but if you already have a large library of the latter, how will you convert the data for use with the Convertible? IBM's solution is to provide optional 3.5-inch drives for the desktop PC line, so you can transfer your data to them. Hmmmm . . . kind of an expensive way to transfer data.

The Convertible was originally code-named Clamshell because of its hinged, flip-up LCD display screen

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*The Macintosh version is priced higher than $40.

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Family Computing Magazine

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From a study at the University of Texas

Hayden has created more than an SAT program. The HAYDEN SCORE IMPROVEMENT SYSTEM covers every aspect of the exam and actually increases students' test scores. It begins with a Sample Test module which simulates an entire exam, and gives the student a score based on the standard 800 point scale. *Using the data from the pre-test, the program automatically customizes the instruction for each student.* And the Math and Verbal Modules include in-depth coverage of every section of the SAT exam.

Each of the three modules has sold separately for $40. Now, the HAYDEN SCORE IMPROVEMENT SYSTEM, which contains all three modules, is available for $40.* *Isn't a better score on the SAT worth $40?*

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(25 lines by 80 characters). The screen may be detached and replaced by an optional monochrome or color monitor when the system is not in transit—hence the name Convertible.

Sadly, however, the Convertible is incompatible with all existing PC monitors, so if you do want to "take the top down" it will cost you extra. Also optional for the Convertible are an internal modem ($450) and a small dot-matrix printer ($295) that clamps onto the back and produces pretty good print.

Prices Slashed. IBM is not known as a price-cutter, but a declining market share does strange things to people. IBM's price reductions (13% on the PC, 26% on the XT, and 12% on the AT in May, and then another round of up to 18% in July) have spurred compatible manufacturers to do the same. Indeed, a price war is being waged, and the short-run winner will be the consumer. If you've held off buying a PC because of high prices, it's time to reconsider. Between now and Christmas, you should see some real bargains.

News Squib of the Month. IBM has announced formation of the Publishing Systems Business Unit to develop "desktop publishing" tools—both hardware and software. However, IBM is avoiding use of the term desktop publishing, which is now dominated by the Apple Macintosh and LaserWriter printer. "Computer-aided publishing" is IBM-speak for this fast-growing application.

PHIL WISWELL *is a computer consultant for small businesses and a computer journalist.*

MS-DOS

BY STEVE MORGENSTERN

While IBM itself failed spectacularly at producing a special computer for the home market, plummeting prices of IBM-compatible computers are putting lots of MS-DOS machines onto family desktops. This trend has not gone unnoticed by recreational software publishers, who are now finding a whole new audience clamoring for some fun after Mom or Dad puts *1-2-3* away for the night.

Doug Carlston, president and CEO of Broderbund, a major publisher of productivity and entertainment software for the home market, sees the IBM format as a "definite growth market, thanks to the clones, the Tandy 1000, and the price cuts from IBM itself." Plenty of top-notch Broderbund entertainment products from the Apple/Commodore world, including hits *Where in the World Is Carmen Sandiego?* and *Karateka*, are being adapted. New products such as *Toy Shop* (a construction set) and *Breakers* (adventure game) are being introduced in IBM format along with the traditional Apple and Commodore versions.

Other major game publishers are actively courting IBM players—Activision (conversions of *Hacker* and *Borrowed Time*, new products *Hacker II: The Doomsday Papers* and *Shanghai*) and Mindscape. I got to play a prerelease version of Mindscape's IBM conversion of *Balance of Power*, Chris Crawford's sensational simulation of superpower politics. Using Microsoft *Windows*, it ran beautifully. Though the programs have not been officially announced, Mindscape is working on IBM versions of its hit Mac game *Déjà Vu* and the sequel, *The Uninvited*.

Mac to MS-DOS. Translating Mac games for IBM compatibles seems particularly appropriate. After all, the screen resolution of MS-DOS machines isn't bad—it's just the color selection that's awful. Since Mac games don't have color to begin with, nothing much is lost in the translation. Of course, you may need a mouse or a joystick to play the game.

What's in a Name Department. Does IBM own the letters XT and AT? Big Blue says so (they're registered trademarks) and has sent letters to compatible makers who use XT and AT in the names of their machines, threatening to take legal action.

Consumer Retorts? The folks at *Consumer Reports* magazine have a problem. They've tested nine IBM compatibles, and their favorite so far is the Leading Edge Model D. However, Leading Edge responded to this good news by running an ad quoting the CR review, and that is a major no-no according to the publication, which never gives permission for their material to be quoted for commercial purposes. The magazine suggested that "some readers may consider this insistence on taking commercial advantage of our good name reason enough to look elsewhere." At last look, Leading Edge had dropped the quote from its advertisements.

Contributing editor STEVE MORGENSTERN *owns a Leading Edge Model D.*

TANDY

BY NICK SULLIVAN

Got a CoCo and an IBM compatible (like a Tandy 1000) in the same house? Now you can move files between the two "incompatible" machines. COCO-UTIL ($29.95 plus shipping; Spectrum Projects; [718] 835-1344) runs on an IBM compatible with MS-DOS 2.0 (or higher), and 128K RAM (or more). You can copy a CoCo file to MS-DOS and vice versa, format a CoCo disk, delete a CoCo or MS-DOS file, and more.

Model 100, 102, and 200 owners (and NEC PC-8201) can also trade files with IBMs and compatibles, if they use the Tandy or Brother 3.5" portable disk drives with their notebook computers. However, they will need a little extra software—namely, LAPDOS ($90) and Ultimate ROM II ($230). Both are from Travelling Software;(206) 367-8090.

LAPDOS allows IBM PC, XT, or AT compatible computers to use the portable 3.5" disk drives, and it includes a program called *Exchanger*, which allows Lotus' *1-2-3*, *ThinkTank*, *SideKick* and others to share their data files with Ultimate ROM II files. ROM II is a plug-in chip that contains *T-Word*, *T-Base*, and *Idea!*, an outline processor.

TandyNet. The four Tandy Forums on CompuServe, formerly independent entities, have been joined together to form TandyNet. For the Tandy/TRS-80 computers and the OS-9 operating system that will be used with the next generation of CD ROM drives, you'll be able to get answers to your technical questions. Simply type GO TANDYNET and select the appropriate Forum.

Making Christmas Plans? Next month, we'll give a rundown of Tandy's new products as the company prepares for another "ring-em-up" Christmas season.

Next month, former UPI columnist STEVE MILLER *will take over the Tandy column.*

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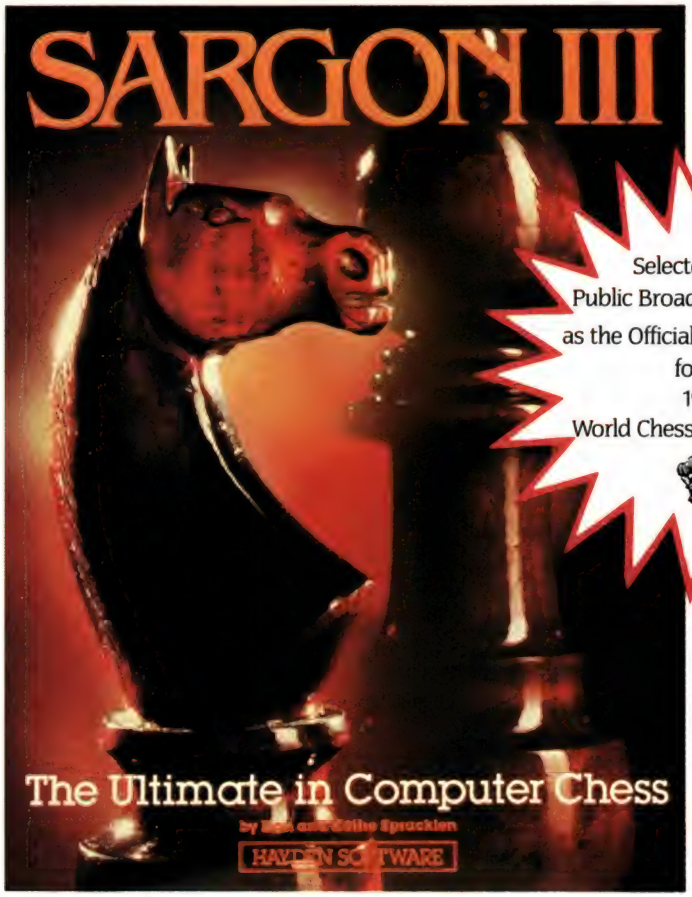

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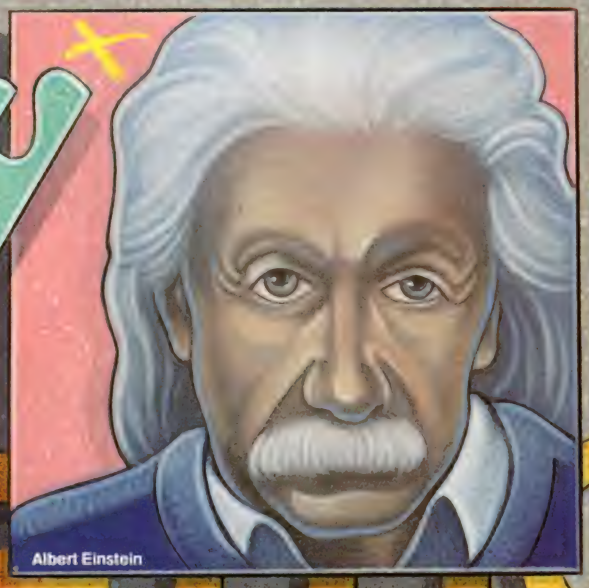

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PARENTS' GUIDE TO LEARNING AT HOME WITH COMPUTERS

There are 14 million computers rapidly beeping and blinking away in American homes and schools. Why are parents and educators turning all of these computers on? To help today's youth better face tomorrow's job market, tomorrow's computer-literacy requirements, and tomorrow's spelling test.

For parents, the computer has become an electronic educational wizard, an explorer, a tutor, and a coach, challenging their children to learn in ways that were never before possible. But the big news in educational computing this year is not the startling fact that computers are now in the home, nor that computers can help children learn foreign languages, calculus, or programming. The real news this school year is that parents and computers are making an educational impact in *so* many homes for *so* many different applications.

In FAMILY COMPUTING's "Second Annual Parents' Guide to Learning at Home," we report on the state of educational computing. We look at the *whos*, *whats*, *whys*, and *hows* of learning with computers in the school and at home. Inside these pages you'll also find:

- Questions that you can ask teachers and school administrators to make sure the schools' computers are being used effectively.
- Tips for using a computer at home with your children.
- Sound advice on home learning from three educators.
- What you should know about finding educational software.
- A listing of additional resources to help you get more information on using computers for learning.
- A national survey that will give *you* the chance to tell *us* how families are using computers for education.
- A roundup of 33 educational software packages chosen by FAMILY COMPUTING's software reviewers as the "best of the best in 1986."

ILLUSTRATIONS BY JACQUELINE CHWAST

THE HOME AS AN EDUCATIONAL HUB

BY SALLY REED

A few years ago, Jeffrey Zare, 11, of Sarasota, Florida, was having difficulty learning to write with a paper and pencil. His 14-year-old brother, Andrew, liked art—and little else. When their mother, Joan, brought home a Tandy Model III computer, this is what happened:

Andrew, the artist, now uses the computer to create graphic designs, and he also learned how to program. Jeffrey wrote his first words on the computer. Then he went on to learn BASIC and is now writing his own programs. He surpassed his mother's expectations when he created a math program called *Number Eaters*, which won several awards, including first prize in a national contest for young programmers.

Like the Zares, many families are using computers to stretch their potential as educators. "The home is far ahead of the school," said Mary Alice White, director of the Electronic Learning Laboratory at Teachers College, Columbia University.

Education is a major reason parents say they buy computers. According to LINK Resources Corp., a research and consulting firm that monitors the electronic media field nationwide, between 1984 and 1985, the percentage of computer owners who reported using their computers for education jumped from 45 percent to 64 percent, while the use of entertainment software actually dropped from 66 percent to 64 percent.

WHAT MOTIVATES PARENTS?

Parents now believe that if their children use educational software at home, it will help their performance in school. The Learning Company, a California-based educational software publisher, randomly surveyed 500 computer owners with children under 15 years of age. Ninety-seven percent said the educational software they buy at home is helping their children learn. According to the company's survey, a surprising 45 percent claimed that software can actually boost their children's IQs.

What motivates parents to experiment with computers as educational tools in the first place? "We want very much to provide our children with a head start in life and to make learning fun and easy," said Christine Roberts, a mother of three who lives in Bristolville, Ohio. "We also want to be able to tailor learning to our children's needs."

Other parents are concerned that their schools aren't doing enough. "Although my son does have access to computers in school," said Veronica Stephen, of Georgetown, Illinois, "he has little time during school hours to use it. Consequently, most of his work on a computer can only occur during evening hours when he is at home."

Mary Fletcher of Pittsburgh, Pennsylvania, agreed: "With only a few computers, the school concentrates on teaching a few students at a time how to operate a disk drive, how to use the keyboard, and how to do some BASIC programming," she said. "The school doesn't have enough computers to teach other skills."

HOW ARE SCHOOLS USING COMPUTERS?

While many parents feel there aren't enough computers in schools, the penetration of new technology is growing dramatically. Between spring 1983 and spring 1985, the number of computers in use in elementary and secondary schools had *quadrupled* to a figure of more than 1.2 million units in American schools, according to the John Hopkins University Center for Social Organization of Schools. Last year, 15 million students used computers in school, according to the study.

And what about software? LINK, the market-research firm, estimates that software sales to schools increased from 1985 to 1986 by 15 percent to $150 million. A 1985 LINK report, titled "The K-12 Market for Microcomputers and Software," listed the following software titles as "having made the greatest penetration in schools": *Bank Street Writer* (Broderbund Software and Scholastic Software), *Apple Logo* (Apple Computer), *Apple Writer* (Apple Computer), *PFS: File* (Software Publishing and Scholastic Software); *MasterType* (Scarborough Systems); *The Factory* (Sunburst); *Snooper Troops* (Spinnaker); *MECC Elementary Volumes* (MECC); *Typing Tutor* (Microsoft); and *Microzine* (Scholastic Software).

WHAT SOFTWARE IS EDUCATIONAL?

Unlike the programs that your children are probably using in school, software used at home doesn't have to follow a particular curriculum to be "educational." Software that helps your child learn to do *anything* better—whether it is in reading, geography, art, music, programming, etc.—is educational.

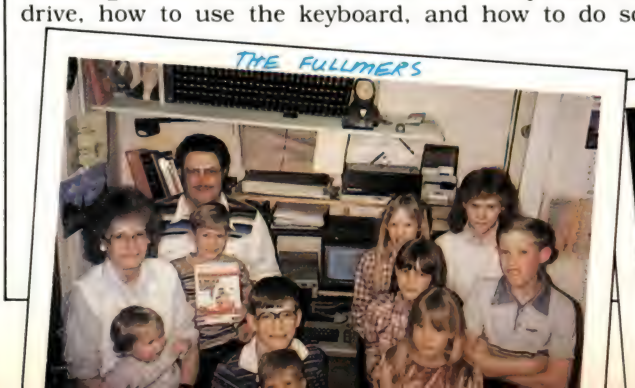
In general, you should look for software that is based on sound learning principles and is both easy and fun to use. You might also look for subject-specific programs that correlate with classes that your children are taking in school.

WHEN DO YOU START?

The question of when to introduce children to computers has caused debate. Some parents and educators argue that young children aren't developmentally ready to understand the abstractness of software. In addition, they say that computers hinder social interactions.

However, proponents of the use of microcomputers in early childhood education say that computers can facilitate and even accelerate children's problem-solving skills and academic achievement. They also say that computing is a highly social activity when students work together.

Studies have shown that using computers can help young children build certain skills, such as reading readiness. In a study released in April, Professor Robert Hess of Stanford University concluded that children using computers in their kindergarten classes and at home made significant gains in their reading-readiness skills. The study, called "Microcomputer Use in Kindergarten and at Home: Design of the Study and Effects of Computer Use on School Readiness," involved 188 kindergarten students in five schools in the Cupertino, California,



district. Software used in the study consisted of games, simulations, and drill-and-practice programs that coincided with the goals of the kindergarten curriculum. The study found the following:

- The computer-using groups gained significantly more in reading-readiness skills than those not using computers in the classroom.
- The students with computers at home and at school gained more in reading readiness than those with classroom use only.
- Girls and boys gained about the same degree of reading-readiness skills.
- The computer-using groups gained more in computer-related skills—such as knowledge of keyboard and techniques for operating hardware and software.

It's no longer uncommon for a toddler to use a computer to type his or her name before printing it with a pencil and paper. Preschool children are learning letter recognition and memory skills, writing simple commands, and learning to manipulate the keyboard.

Four-year-old Jake Fullmer of Arimo, Idaho, writes his name using *Kindercomp* (Spinnaker Software). His six-year-old brother, Jim, who has been using the computer for two years, learned to type his name and other words on the computer long before he could print. "Jim's kindergarten teacher told me he is way ahead of the other kids in his class," said his mother, Trudy, "especially in math. We have many programs that he uses. He could add and subtract before he started school."

Six-year-old Gwyneth Jean Roberts enjoys the *Muppet Learning Keys* (Sunburst) and *Donald Duck's Playground* (Sierra On-Line). Her 5-year-old brother Christan Kenneth used the computer to learn how to count, recognize different shapes, and improve his memory skills.

TRADITIONAL SCHOOL SUBJECTS

Once children get beyond kindergarten, the educational uses for computers begin to multiply. Parents are reporting that computers are helping their children build their educational foundation in virtually all subject areas. For example, in the Hindman household of Osborne, Kansas, 7-year-old Christine and 4-year-old Robert are learning how to read and spell with the help of the computer. Christine, a first-grader, uses both an Apple IIe and an IBM PC*jr* to master letter recognition, spelling, and reading. "Using the computer has created an excitement and enthusiasm for reading," said Christine's and Robert's mother.

These kinds of results do not surprise many educational researchers. One three-year study, called Project DISC (Developing Indian Software Curriculum), involved Sioux Indians in grades three through six with limited English proficiency, who were pulled out of their normal classroom programs for 30 minutes each day to attend a microcomputer laboratory. The study showed that the students who attended the computer lab significantly improved their reading and language skills.

Parents have noticed the same kinds of academic gains in subjects that require drill and practice. Computers can make drill and practice easier on parents, teachers, and the students themselves.

"One of the best methods of teaching is repetition," said Rex Woodward, a father living in Franklin, Idaho. "In

??s TO ASK SCHOOLS

The most effective learning with computers comes from a partnership between the home and school. Feel free to question teachers and school administrators. They'll most likely be able to assist you, give you feedback, or clear up your confusion. Your questions will let the school know how involved you are with your children's education. Here are 10 questions you might want to ask school officials about the state of educational computing in your children's schools.

1

Do the schools have a stated policy about the use of computers in the classroom? Does that policy encourage the use of computers in the classroom?

2

Is technology integrated into the curriculum for each grade? Computer use shouldn't be limited to just a few of the grade levels.

3

Are computers being used in a variety of subject areas, such as social studies, math, or even art?

4

How often does a student get to use a computer during the course of a week? A month? A year? Can a student use the computers more frequently if he or she wants to?

5

Are there any extra classes before or after school or during the summer for students interested in more extensive computer training?

6

Do the schools have computer-literacy requirements? What classes do the schools require or recommend in order for your children to reach that level of computer literacy?

7

If there's a problem with financing computers in the schools, what's being done to raise money? How can you help? Maybe the parent-teacher association will help organize events to raise money for new equipment.

8

Are there any parent-information workshops to help you pick computer programs to strengthen your children's learning weaknesses?

9

Are there any practical ways for parents and teachers to exchange important computer learning information (e.g., a home-school newsletter)?

10

Does the school library have software that can be taken out on loan? If not, do they plan to establish a software library in the near future?

DOS AND DON'TS

What can parents do to make sure their computer is a partner in the home-learning process? Here are "Dos and Don'ts" to help you and your computer make a difference in your children's education.

DO get comfortable with computers. If you're going to share in the learning process, you'd better know how to turn on a computer, boot up and use software, make a printout, etc.

DO participate. "We're always there with the children when they are using the computer, to lend them help if they need it, and also to give support," said Cheryl Hunt, a mother of two living in Sartell, Minnesota. "The computer cannot be educational all alone. The computer station provides an environment where the children are learning sharing, patience, and cooperation. The benefits are enhanced when they sit down with a parent to work."

DO find your own uses for the computer. Set an example by using the computer to keep your personal budget, write letters, or learn a foreign language. The computer can be a useful tool for everyone in your home.

DON'T make learning at home a chore. Your children don't want home to feel like school. To be successful, learning at home works best when it's both rewarding and entertaining. Keep this in mind when shopping for software.

DON'T pester your kids. Learning at home has to be fun. If your children lose interest in the computer for prolonged periods, try to uncover the problem. The software may be too difficult, too boring, or too simplistic.

DO use computers with preschoolers. Here are some tips from Mary Fletcher, a mother living in Pittsburgh, Pennsylvania: 1) Record software instructions on a tape recorder, with suitable pauses. 2) Put matching stickers on the game package and the tape cassette. 3) Draw a "yucky" face on certain programs to tell your child to leave them alone.

DO talk to teachers. Consult your children's teachers to find out what the kids are learning in school. Try to select software that corresponds with their school curriculum. The teacher may even be able to make software recommendations.

DO talk to other parents. You can get tips from other parents who are buying software for their kids. Swap suggestions, share stories, complain, or brainstorm.

DON'T treat each child the same way. Remember that your children have different tastes and needs, and you should find software that suits their personalities.

DO choose software carefully. Obviously, all software isn't equal in quality. High prices and lots of hype don't guarantee that the software is any good. Question knowledgeable salespeople. You'll also find helpful software reviews in every issue of FAMILY COMPUTING.

this, the computer has no human equal. The hours of going over and over a subject that a computer can handle one on one with a child would send the most patient of us mortals to our graves. In all of this, the computer will not get the slightest bit upset, or forget to issue praise."

Ten-year-old Cami Fullmer "was having a terrible time learning her multiplication tables," according to her mother. "She hadn't memorized them and when they started learning division in school, she was really having trouble. We tried to help her but found she was more receptive to learning them on the computer with multiplication software. Maybe the rewards were more immediate than what we were giving her."

Cami's 11-year-old sister, Kara, used the computer to help her learn U.S. geography. "She had to memorize the states and capitals, which was made easy by a program that made a game of it," said her mother. "Kara learned the states by filling in blanks and answering multiple choice questions, and she had fun at the same time."

As for science, the more your children know about computers, the more they'll know about computer science. They can continually improve computer-science skills—such as keyboarding and programming—by learning about and working with computers. But computers can also be important tools in the more traditional fields of science. For instance, 14-year-old Joseph Liu of Decatur, Alabama, uses the computer to write biology reports. Marc Reuter, a 12-year-old from Hollidaysburg, Pennsylvania, used the computer to compile facts for his science-fair project. And Jordan Stephen, 15, of Georgetown, Illinois, uses a program to study frog dissection.

CREATIVE LEARNING TOOLS

Your children don't have to be studying the standard school subjects—reading, writing, math, science, social studies, etc.—to be learning. The more creative subjects that your children study in school, such as music and art, are also educational. Computers won't replace piano lessons or Drawing 101, but they do encourage people of all ages to stretch their imaginations and accomplish astonishing creative feats.

Budding artists are using graphics software and their creative energies to make signs, banners, cards, and stationery. Graphics software includes programs that let your children draw, animate, save, and print out. Some youngsters are using software to illustrate the books, papers, and letters they write.

There are music programs that can teach your children how to read notes, compose music, train their ears, and much more. Christine Hindman is learning musical notes and creating her own songs with *Music Maestro* (Springboard Software). And the Copley family, of Katy, Texas, composed a program of computer gospel music that has appeared on electronic bulletin boards around the country.

NEW LEARNING TOOLS

There are also plenty of programs that don't fall into a particular school-subject category, but are invaluable

educational aids for your children. Categories that immediately come to mind are word processors, data bases, and spreadsheets. Word processing is one of the top educational uses of the computer. Several software packages have revolutionized the processing of words, enabling families to teach themselves to type and learn to correct their copy with ease.

Nicole King, an 11-year-old who lives in Claremont, California, produces a neighborhood newsletter. She checks her spelling with *Webster's New World Spelling Checker* (Simon & Schuster). Nicole is improving her spelling, grammar, and writing abilities, while having fun and strengthening her family and neighborhood ties.

In the evening hours at home, students are also learning to use spreadsheets and data bases to complete homework assignments and to keep inventories of their stamp, record, and book collections.

ADULT EDUCATION

Learning at home is not just for children. Adults are finding that learning has no age limit and people of all ages are taking college courses via computer, learning to speak new languages, and even learning to fly airplanes.

Gerry Bibaud of Edmonton, Alberta, in Canada, bragged: "I have never been in a cockpit of a Piper Cherokee Archer. All I know about flying comes from subLOGIC's *Flight Simulator II*. Did you know that within fifteen years of Columbus' first voyage, the Spanish had conquered America's most advanced civilizations and had begun to consolidate one half of the territory into a colonial empire? I didn't until I played *Seven Cities of Gold* (Electronic Arts). I also learned the major constellations of the sky from *The Halley Project* (Mindscape)."

Joyce McDonald of San Antonio, Texas, taught Russian for three years but after she took a leave to raise children, her teacher's certificate began to gather dust. However, her love for the language was not forgotten. Frustrated with the lack of good software packages to teach herself more Russian, she went on to learn—at home with correspondence courses—BASIC, Pascal, C, Fortran, LISP, and Cobol. She is now planning to write an instruction program to teach others the Russian language.

WHAT'S AHEAD?

During the next few years, the number of computers in the schools and at home will continue to skyrocket. And the educational uses for these machines are sure to proliferate. Much of the growth will be spawned by advancements in both hardware and software, but the home will help pave the way for many imaginative and successful uses of computers in education. As technology changes, families who are now computer literate are likely to ride on the crest of the technological wave. And their children will be among those who get the most out of the technology. *(Note: Every month,* FAMILY COMPUTING *explores issues involved with using computers to learn at home. Watch for articles in upcoming issues that deal with subjects such as special education, inequities for girls, and touch-typing skills.)* FC

MORE RESOURCES

Where can you get more information on using the computer for learning? Besides checking out the September 1985 issue of FAMILY COMPUTING (page 33) for suggested books, organizations, and electronic-information clearinghouses, try these resources:

ORGANIZATIONS

There are two organizations that supply parents as well as teachers with excellent materials. The International Council for Computers in Education (University of Oregon, 1787 Agate St., Eugene, OR 97403; [503] 686-4144) emphasizes educational computing at the precollege level. Minnesota Educational Computing Consortium (MECC), 3490 Lexington Ave., North, St. Paul, MN 55126; (612) 481-3500, provides an assortment of information, particularly on software. Write for a free catalog.

Also, don't forget to contact your local YMCA's and YWCA's, users' groups, libraries, and colleges.

SOFTWARE DIRECTORIES

There are a number of guides available to help you in your search for the best educational software for the entire family. One directory that you'll want to check out is the *Family Guide to Educational Software*, a software directory that includes descriptions of educational packages. The most recent issue, released in the summer of 1986, includes 96 pages of educational software ($2.95; a yearly subscription is available for $5.00; published by the Garlinghouse Company of Middletown, Connecticut; [800] 235-5700).

Here's another directory that might help you select new software: *Only the Best: The Discriminating Software Guide for Preschool-Grade 12: 1986 Edition* is a quick way to find highly-rated educational software ($19.95, from Education News Service, P.O. Box 1789, Carmichael, CA 95608; [916] 488-4623).

BOOKS

This school year, there are several new books for children available at your local bookstore. *Computers: Time, Strings & Pizzas* by Stuart and Donna Paltrowitz; *Computers: Cookies, Marbles & Games*, and *Computers: Pascal, Pong & Pac-Man*, by Robert W. Bly, are all published by Banbury Books as part of a new series ($3.95 each) on computers and computer operations for children in grades four through six.

*Kids and the IBM PC/PC*jr by Edward H. Carlson ($19.95, Datamost Inc., 1983); has 238 pages of information on programming for parents, teachers, and kids—from bare-bones programming to advanced programming. Write 9907 Canoga Ave., Chatsworth, CA 91311; (818) 709-1202.

ELECTRONIC FORUM

FAMILY COMPUTING's own electronic forum on CompuServe Information Service includes a section created for families who want to share educational ideas. Parents and children can meet electronically and exchange tips and suggestions. The FAMILY COMPUTING forum is open to all CompuServe subscribers by typing GO FAMFORUM.

WHAT THE EXPERTS SAY...

The use of computers in schools gets a lot of attention. An assumption is sometimes made that kids and machines threaten ham and eggs as a winning combination, that they're a natural, requiring little effort from professional educators. That's *not* always the case.

Many educators across the country have spent years figuring out how to make computers and kids tick. In the course of their day-to-day work with children and computers, they've gained valuable insight that they can pass on to parents, who are only beginning to merge computers and learning. FAMILY COMPUTING asked three of these pros—David Moursund, Terri Rosegrant, and Ann Dana—to offer advice to parents like you, who want to use computers to make a difference in their children's education.

DAVID MOURSUND *is founder and Chief Executive Officer of the International Council for Computers in Education, a professional organization and information exchange group. The Oregon-based organization specializes in precollege learning.*

TERRI ROSEGRANT *is Associate Professor at George Washington University in the College of Education and Human Development. She researched the use of technology with children at Arizona State University.*

ANN DANA *is a microcomputer consultant and teacher for grades K-8 at District 181 in Hinsdale, Illinois. She is also an adviser for* Teaching and Computers, *a magazine published by Scholastic Inc.*

. . . ABOUT PARENTAL INVOLVEMENT

DAVID MOURSUND: Encouraging learning in the home is an individual family choice. If you're a parent who decides to get involved in the learning process, and you're enthusiastic, then things can happen. You have to be interested. Learn to use computers in your own job, life, and parenting. When introducing young children to computers, you can compare computers to books: You read books to your children to orient them to reading; use the computer to get them accustomed to using hardware and software.

TERRI ROSEGRANT: You can get involved by working with schools as much as possible. Ask teachers how you can use software to help your children in areas where they are having difficulties.

. . . ABOUT WORKING WITH SCHOOLS

MOURSUND: I would encourage parents to lean on schools to do more. Get involved in a parent-teacher association and talk to your children's teachers. Some PTAs do the significant buying of hardware and software. I know of one PTA in North Carolina that runs a second-hand store. Some of the profits from the store have been used to buy computers for the schools.

. . . ABOUT DATA BASES AND SPREADSHEETS

ANN DANA: Schools are just getting into and using data bases and spreadsheets with students. But teaching children in classes how to use these programs is difficult to do. I think that learning how to use them and finding practical learning applications can be handled more efficiently by parents in the home.

. . . ABOUT WORD PROCESSING

MOURSUND: If there's one piece of educational software that you'll use at home, it's a word processor. Obviously, word-processing programs are a way to improve productivity; but they can also help your children with their writing skills, make it easier to correct errors, and make a paper look nicer.

Can a word processor improve your children's writing? If your children write quite a bit with the word processor, and you have a positive attitude toward word processing, then yes.

DANA: A word processor is the best family program available. Get one. And, of course, along with the word-processing software, your family can get a spelling checker and even a grammar checker.

. . . ABOUT DRILL AND PRACTICE

ROSEGRANT: Computer-aided instruction software has been given a bad rap, unfairly so. It *does* provide children with practice in areas where they need it. For example, your kids can use drill and practice to memorize the multiplication tables by working on the computer and getting infinite practice.

DANA: I generally wouldn't recommend drill-and-practice software unless there's a need for it—that is, unless one of your children is having difficulty in a particular area. Math and spelling are the areas that immediately come to mind. However, there is math software that children enjoy, such as *Math Shop* (Scholastic Software), and that isn't just drill-and-practice.

. . . ABOUT GAMES

MOURSUND: You *can* look upon an adventure game as an educational program. If you support adventure games, you'll see that they can help your children develop problem-solving skills.

. . . ABOUT MUSIC AND ART SOFTWARE

ROSEGRANT: Using computers, you can make a real impact on your children's learning with software that teaches the fine arts. I don't think parents have enough information on what's available in this area. Unfortunately, parents aren't kept abreast of the potential of computers in the arts. That's partially the fault of the schools, because computer teachers are often math people.

Without a musical instrument, your kids can learn so much about music. It really gives them a lot more opportunity for exploration than a musical instrument does. With music and graphics software and with word processors, your children are able to take things back when they do something wrong. With the traditional music, art, and writing mediums, there's a sense of accuracy that makes doing it a painful process. With computers, your children can say "oops" and fuss with it or "yuck" and zap it.

FINDING THE RIGHT SOFTWARE

BY DAVID HALLERMAN

Talking to computing families who use educational software packages is part of David Hallerman's job description. David, FAMILY COMPUTING*'s very own reviews editor, works with families who evaluate educational software for the magazine. He calls up Mom, Dad, or the kids, and asks them why they like or dislike a package and finds out what the software actually teaches. And when the families shop for their own software, they often turn to David with* their *questions. Here are the questions these families ask David most often, along with his answers.*

Q. What makes a program "educational"?
A. Believe it or not, *most* programs are educational—depending on how you look at them. Take your word processor, for instance. While most people consider word-processing programs as productivity packages, if yours is easy to manipulate, it can help your children improve their writing and make homework easier. And your children's music program may sound like loud noise to your neighbors, but they've created that noise with their own minds and their own two hands. Among the other programs that I call "educational" are subject-specific software, graphics programs, data bases, spreadsheets, programming software, and typing programs.

And don't fall for the stereotype that educational software is just for kids. *You* can learn how to read music, speak Spanish, or program. If you're open to new ideas, your computer can give you a lesson or two.

Q. What qualities distinguish good educational software from mediocre?
A. Generally, those same qualities that distinguish a good workbook from a lousy one. You should, naturally, find programs that are suited to your children's ages and abilities and that are based on sound learning principles. Beyond that, your children must *enjoy* the educational packages you buy—or they won't use them.

You can uncover some of the other elements of good educational software by looking through this year's "Critics' Choice Awards" (page 41). A number of these software winners promote good learning habits by prompting kids to work through problems on their own rather than telling them exactly what to do.

In addition, good software can stay a step ahead of your children. For instance, *The Halley Project* (Mindscape), a "Critics' Choice" winner, consists of a series of "missions" exploring our solar system, each progressively harder than the last. The more that software lets your kids go off and explore—to discover their own paths rather than being forced down one—the longer the program keeps their attention and the more it fosters learning. These qualities are the stuff of good educational software and without them, the educational packages you buy may wind up wasting away on your shelf.

Q. Should I buy the same packages that my children are using in school?
A. Yes and no. Some programs used in the classroom give the most bang for the buck when an adult (generally a teacher) is hovering nearby, jumping in to help if a child looks lost. If you're prepared to work closely with your children, such software may be a great idea, especially when covering subjects that give your kids trouble. For instance, teachers and parents have discovered reading packages and drill-and-practice math and spelling programs that really make a difference when used at both school and home.

Unfortunately, many of the titles that work like a charm in school aren't very much fun at home. It's a rare child who finds lifeless software absorbing for very long, especially at home—where the alternative might be playing a game. But, fear not: Many entertaining educational programs are grabbing children's attention in school, and you can probably find the same or similar packages for use at home.

Q. How can I find the software that is best for my family?
A. Research! And then do more research. Read reviews, like the ones in FAMILY COMPUTING. Ask friends and your children's teachers for help, or ask your children if they've heard about or seen some good educational programs. Consult software directories, pay attention to software ads, and try calling the publishers of titles that interest you to request brochures and other information.

But no research can substitute for hands-on experience. Find a way to roll up your shirt sleeves and pop in a demo disk. Make every effort to test drive software you buy for your kids. After all, you wouldn't buy a novel without flipping through the pages, unless it came highly recommended. Friends and teachers can let you examine their software, or if that's not possible, see if you can inspect the program (or at least the package's documentation) in the store.

In the best of all possible worlds, make your buying decisions by synthesizing everything you've read and heard with your own impressions of the package.

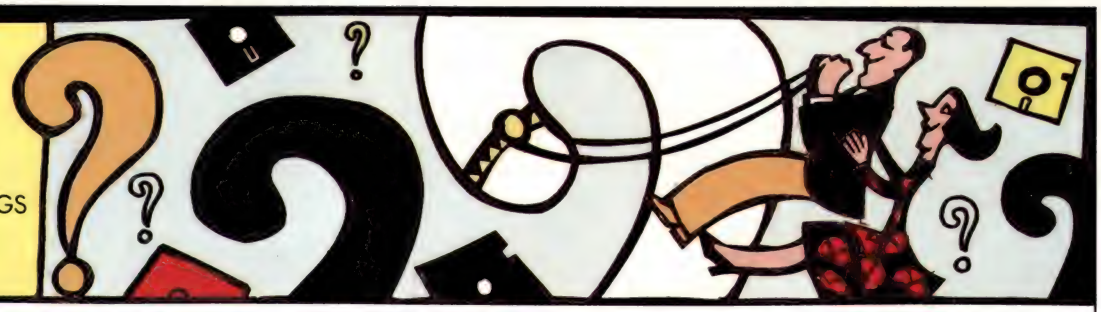
Q. Where are the best places to shop?
A. You can buy software in computer- or software-specialty stores (like ComputerLand), mass merchandisers (for example, Toys 'R' Us), or through mail-order houses. If you're hunting down a particular package and can't seem to find it, try calling the manufacturer; he or she should be able to direct you to a store that carries the product, or you may be able to place your order on the telephone.

Where you decide to shop depends on what's more important to you—service or price. Computer- and software-specialty stores generally will offer you the best service since salespeople will demonstrate software, which takes time and energy (translation: money). Expect to pay more at stores that offer these personalized services. The B. Dalton and Walden bookstores, which have opened well-stocked software sections across the country, offer better price tags—but it will be harder to find a salesperson who knows one software package from another.

If you've done some homework before setting out on a software shopping spree, you may not have to leave your home. A reputable mail-order company can be a good source for discounted software. And the large chain stores—such as Toys 'R' Us, Sears, and K-Mart—are also good places for buying "sure things" for less money.

YOU TELL US..

AND WIN AN APPLE IIGS OR SOFTWARE!



Is your computer living up to its potential as an educational tool? You tell us, by answering FAMILY COMPUTING's first national survey on families and educational computing. By answering a bonus question, you could . . .

WIN AN APPLE IIGS OR SOFTWARE!!!

Just fill out this brief questionnaire and, on a separate sheet of paper, answer the bonus question. Then tear out this page (or photocopy it), and mail it, along with your answer to the bonus question, to Education Survey, c/o FAMILY COMPUTING, 730 Broadway, New York, NY 10003.

1. Does your family use its computer for learning?
_____ Yes
_____ No

2. How important is learning as an application for your computer?
_____ It's the most important application.
_____ It's very important.
_____ It's fairly important.
_____ It's not important.
_____ We don't use our computer at home for learning.

3. What types of software are used in your home to promote learning? (Indicate all that apply.)
_____ music
_____ art
_____ math
_____ science
_____ language arts
_____ social studies
_____ geography
_____ foreign languages
_____ SAT software
_____ word processing
_____ data base
_____ spreadsheet
_____ programming
_____ other (please specify)
_____
_____
_____ don't use any software for learning

4. Are there any school-age children in your family?
_____ yes
_____ no (skip to question #8)

5. Do you have one or more children who enjoy using computers and others who don't use them at all?
_____ yes
_____ no

6. Do you think your children are spending enough time using computers in their schools?
_____ yes
_____ no

7. How much time do you think your children should spend using computers to learn at home?
_____ as much time as possible
_____ up to 10 hours a week
_____ a couple of hours a week
_____ none

8. When it comes to using a computer for educational purposes, whom do you turn to for guidance? (Indicate all that apply.)
_____ teachers
_____ FAMILY COMPUTING magazine
_____ other parents
_____ your kids
_____ books
_____ advertisements
_____ get no guidance from anyone
_____ other _____

9. If there are females in your home, do they use computers for educational purposes?
_____ more than the males do
_____ less than the males do
_____ the same amount as the males do
_____ no males in the household
_____ no females in the household

BONUS!! On a separate piece of paper, tell us about the educational uses of computers in your home. The family whose letter best demonstrates a dedication to learning in inventive and rewarding ways will win an Apple IIGS (see box, below). Three other families—the runners-up—each will win $100 worth of educational software.

GRAND PRIZE!! 256K APPLE IIGS

Includes system (CPU), keyboard, mouse, disk drive, and RGB color monitor. For more details, check out our Apple IIGS Special Preview in this issue.

Please fill in your name, address, and telephone number below so we can contact you if you are chosen as one of our winners:
Deadline: November 28, 1986
Judges: FAMILY COMPUTING editors

Name: _____

Address: _____

City: _____

State: _____ Zip code: _____

Telephone #: _____

WHAT COMPUSERVE SUBSCRIBERS TOLD US

FAMILY COMPUTING asked nearly 200 CompuServe subscribers what they think about using computers for learning. The on-line survey they completed between June 13 and July 13 was almost identical to the survey that appears here. This is what the survey respondents had to say about educational computing:

- 81 percent use their computers for learning.
- 61 percent say they buy educational software.
- Three-quarters of the respondents who have children feel that their children aren't spending enough time with computers in schools.
- 36 percent of the respondents plan to buy even more educational software than they have bought in the past, while less than 1 percent plan to buy less
- Who do these computer users turn to for guidance? 49 percent turn to books; 47 percent read FAMILY COMPUTING magazine; 25 percent rely on computer ads; 22 percent ask teachers for advice; 12 percent get guidance from their kids; 11 percent take advice from no one; 10 percent turn to other parents.

CRITICS' CHOICE AWARDS

THE BEST OF THE BEST IN SOFTWARE

What are the best educational programs of 1986? Out of hundreds of educational programs that the FAMILY COMPUTING staff and reviewing families see each year, few can be recommended with little or no reservation. We asked our critics to re-evaluate those packages that received the highest ratings during the past year. Which programs are still special? Which ones do you and your kids go back to again and again? Which titles promote learning by combining substance with style? Which encourage the urge to explore? The envelopes, please . . .

COMPUTER SCIENCE

Instant Pascal. Gives the novice Pascal programmer assistance with syntax, gentle reminders when minor errors are made, and instant gratification when work is done properly. Easy, fun, and rewarding. For ages 12 and up. From Apple Computer, (408) 996-1010; for 128K Apple IIe/IIc; $140; reviewed 7/86.

EARLY YEARS

Build A Book About You. Requires family teamwork; pays off with two personalized storybooks for children, ages 5 and up. With scented stickers and book covers you can clean. From Scarborough Systems, (914) 332-4545; for Apple, C 64/128; $25; two additional books are available for $14; reviewed 10/85.

Mr. & Mrs. Potato Head. Select eyes, nose, ears, mouth, and clothing for a personal Potato Head character. Kids ages 4 and older can animate their "potatoes" and play a memory game. Much fun. From Random House Software, (212) 751-2600; for 64K Apple; $30; reviewed 5/86.

Rainy Day Fun. A toy chest on a disk. Lift the lid to find connect-the-dots puzzles that never wear out, Pin-the-Tail-on-the-Donkey tails that don't get lost, and sliding puzzles with tiles that never crack. Better yet, there are seven more activities. For ages 5 and up. THORN EMI Computer Software Inc., (617) 256-3900; for Apple, C 64/128; $40; reviewed 11/85.

Stickybear Town Builder. Playing *Town Builder* has inspired young children (ages 5-9) into some sophisticated conversations, such as whether or not to locate the airport next to the diner. Teaches spatial relations and basic map skills. Simple, yet engaging. From Weekly Reader Family Software, (203) 638-2400; for Apple, C 64/128; $30-$40; reviewed 11/85.

FOREIGN LANGUAGES

Bataille de Mots. Combines game and drill into an exciting method for learning new words. A French translation of Davidson & Associates' classic vocabulary game, *Word Attack*; also available in Spanish and German. For ages 10 and older. From Gessler Educational Software, (212) 673-3113; for Apple, C 64/128, IBM PC/PC*jr*; $50; reviewed 3/86.

GEOGRAPHY

Road Rally U.S.A. A geography and map-reading game for the whole family. Travel via the shortest route and stop at strategically placed gas stations to arrive at your destination. From Bantam Software, (212) 765-6500; for Apple, C 64/128; $30-$40; reviewed 12/85.

Where in the World Is Carmen Sandiego? As a rookie sleuth, track down one of Carmen Sandiego's international thieves who has stolen a precious object from some city in the world. One of those blockbuster packages that comes along every now and then. For ages 12 and up. From Broderbund, (415) 479-1170; for 64K Apple, C 64/128; $35-$40; reviewed 10/85.

INNOVATIVE APPLICATIONS

Car Builder. Design cars from the inside out, learning about chassis style, weight restrictions, gear ratios, and other fascinating aspects of physics and engineering. Offers kids (ages 8 and up) and parents a wonderful chance to expand knowledge and have a good time. From Weekly Reader Family Software, (203) 638-2400; for Apple; $40; reviewed 6/86.

The Dolphin's Rune. You *are* the dolphin as you find and translate hieroglyphic verses hidden on the ocean floor. A multi-sensory creation that requires frequently untapped perceptual skills. For ages 12 to adult. From Mindscape, (312) 480-7667; for C 64/128; $30; reviewed 2/86.

LANGUAGE ARTS

Homework Helper: Writing. Software that helps students (ages 12-18) with essays and book reports, not only by functioning as a word processor, but by acting like a knowledgeable friend, one who asks good questions that get ideas flowing. Proof that educational software need not be hidden under a game format to help children enjoy learning. From Spinnaker, (617) 494-1200; for Apple, C 64/128, IBM PC/PC*jr*; $33-$50; reviewed 4/86.

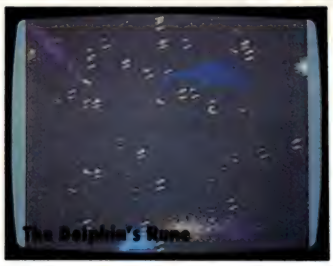
Paint With Words. Explains a word's concept to a child by instantly producing a picture. Highly motivating for beginning readers by giving them a way to build a vocabulary of words associated with pictures. From MECC, (612) 481-3500; for 64K Apple; $50; reviewed 4/86.

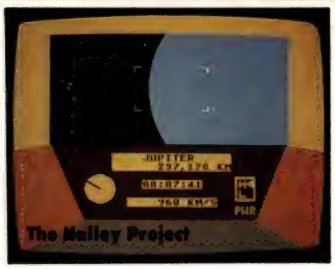
Peter Rabbit Reading. This delightful game motivates young children (ages 3-6) to match letters and to learn and recognize the spelling of simple words. Excellent graphics are a real plus, and the use of spoken words and sounds increases the educational value. From Spinnaker/Fisher-Price, (617) 494-1200; for Apple, C 64/128; $25-$40; reviewed 7/86.

Sea Speller. Practice spelling and reading skills in a race-the-clock underwater adventure. Well-crafted graphics and sound effects entertain without distracting. For ages 6-9. From Spinnaker/Fisher-Price, (617) 494-1200; for Apple, C 64/128; $20-$25; reviewed 1/86.

Word Bank. A vocabulary program with a graphics mode that isn't used to create cutesy pictures; rather, children can create large uppercase and lowercase letters—the same ones they learn to read in school. With four levels in each of four games and over 1,300 words. Highly recommended for beginning readers. From Learning Well, (516) 621-1540 or (800) 645-6564; for Apple; $50; reviewed 5/86.

Writer's Helper. Three of the 22 programs that com-

SPYDER
DRAG: 00420
COEF.: .23
THIS IS AN INCREDIBLY SLIPPERY CAR. A GREAT DEAL OF DESIGN EFFORT WAS OBVIOUSLY PUT INTO MINIMIZING DRAG.
EXIT
TEST COMPLETE
Car Builder




prise this collection are designed to help writers find a topic. Five programs help organize thoughts, and the remaining programs assist in writing. A great tool that does what it says it does. For ages 12 to adult. From Conduit, University of Iowa, (319) 353-5789; for Apple IIe/IIc, 256K IBM PC/PC*jr*; $120; reviewed 8/86.

MATH

Comparison Kitchen. By using colorful cookies, cakes, and breads, youngsters learn about opposing ideas, such as "same" and "different," "least" and "most," and "greater than" and "less than." Good for ages 5-8. From DLM Software, (214) 248-6300; for Apple; $30; reviewed 3/86.

Donald Duck's Playground. Help Donald build a playground for his three nephews. But first, you must get a job to earn money to buy toys for the playground. Four fast-paced games that teach children (ages 7-11) to recognize letter groups, handle money, make change, and match shapes with colors and letters. From Sierra On-Line, (209) 683-6858; for 64K Apple, C 64/128; $30; reviewed 8/86.

MUSIC & ART

Beagle Graphics. A bunch of absorbing programs in one package, such as a versatile drawing program with a palette of over 250 colors and an on-screen "slide projector" for finished work. For ages 12 to adult. From Beagle Bros., (619) 296-6400; for 128K Apple IIe/IIc; $60; reviewed 2/86.

Clip Art Collection: Vol. 1. Provides over 600 new pieces of art for *The Newsroom*. Contains sports, musical instruments, food, famous buildings, a blank calendar, and lots more. For all ages. From Springboard Software, (612) 944-3912; for Apple, C 64/128, IBM PC/PC*jr*; $30; reviewed 12/85.

D.E.G.A.S. As a pioneer graphics package for the Atari 520ST, this paint program manages to put that computer's high-tech hardware to work for you with the kind of sophisticated results that make you ask, "Did I really do that?" For ages 10 to adult. From Batteries Included, (416) 881-9941; for Atari 520ST; $40; reviewed 6/86.

Deluxe Music Construction Set. Gives the whole family more leeway in writing music than any other Mac music program. Enter notes directly on a staff, or click on the keys of your on-screen piano. An entirely new version of a classic. From Electronic Arts, (415) 571-7171; for Macintosh; $50; reviewed 5/86.

Fantavision. Your series of single, still pictures is seamlessly sewn together into an animated "movie." As with a powerful word processor, you need not know all the commands before you begin. Great for the whole family. From Broderbund, (415) 479-1170; for 64K Apple; $50; reviewed 4/86.

Fontasy. One of the prime examples of the "new look" in text-art programs for making signs, family newspapers, brochures, or newsletters. For ages 12 to adult. From Prosoft, (818) 765-4444; for 256K IBM PC/PC*jr*; $70; reviewed 7/86.

Fontrix. The "trick" in Fontrix is its ability to scroll from one high-resolution graphic screen to another and to connect them into one printed page of text and pictures. The page might be a brochure, a newsletter, a sign, or simply a fun and fancy letter to grandparents. For the whole family. From Data Transforms, (303) 832-1501; for Apple, 256K IBM PC/PC*jr*; $95-$155, reviewed 2/86.

Print Master. All sorts of folks will appreciate this worthy addition to *The Print Shop* tradition of all-purpose graphics packages for all ages. Create posters, greeting cards, calendars, banners, and stationery. From Unison World, (415) 848-6666; for Apple, Atari ST, C 64/128, IBM PC/PC*jr*; $35-$60; reviewed 6/86.

The Print Shop Companion. Enhances *The Print Shop* with fine new tools for modifying and creating graphics. Also offers extra fonts and borders and the ability to edit them. Makes calendars and creatures, too. For ages 8 and up. From Broderbund, (415) 479-1170; for 64K Apple, Atari, C 64/128; $35-$40; reviewed 5/86.

VideoWorks. Animates *MacPaint* images into a sequence of pictures so smooth, you'd swear you were watching MacTelevision! The quality is extraordinary. For ages 12 to adult. From Spinnaker/Hayden, (617) 494-1200; for Macintosh; $100; reviewed 11/85.

SCIENCE

Chem Lab. Complete computerized chemistry lab simulates more than 150 chemicals and all the necessary equipment needed to conduct hundreds of experiments. Fosters exploration in which the process of finding a solution is as valuable for learning as the solution itself. For ages 12 and up. From Simon & Schuster, (212) 333-5800; for 64K Apple, C 64/128, IBM PC/PC*jr*; $40; reviewed 5/86.

Science Toolkit: Master Module. Comes with temperature and light probes, which, along with the software, convert your computer into a thermometer, light meter, or timer. Collect data in more than 20 documented experiments that concern important phenomena and are fascinating. For ages 10 to 15. From Broderbund,(415) 479-1170; for 64K Apple; $60; reviewed 4/86.

The Body In Focus. Discover the world under your skin as you view the bones, muscles, and organs of the human body. A wealth of detail graces the program; for example, you literally see the arm muscles contract and relax. For ages 10 to adult. From CBS Software, (203) 622-2500; for Apple, C 64/128, IBM PC/PC*jr*; $40; reviewed 12/85.

The Halley Project. Combined with a pair of binoculars, this program can familarize your whole family with our solar system. At the same time, budding star pilots will get a chance to strut their stuff while they navigate vast voids, orbit planets, and make spectacular landings on barren moons. From Mindscape, (312) 480-7667; for Amiga, Apple, Atari, C 64/128; $30-$45; reviewed 1/86.

TYPING

Typing Well. Comprehensive and engaging learn-to-type program. Proper fingering is graphically displayed, and you get a variety of games and drills for practice at all levels. Suitable for ages 9 through adult. From Learning Well, (516) 621-1540 or (800) 645-6564; for Apple; $50; reviewed 7/86.

Improve Your SAT Scores

STUDYING FOR THE SCHOLASTIC APTITUDE TEST? HERE'S HOW THE SOFTWARE PACKAGES STACK UP

BY GWEN SOLOMON

Laurie Sexton increased her score by 100 points. Rima Ramirez added 120 points to hers. Both students were engaged in the rite of passage called "taking the SAT" and both used their computers at home to study for it.

The Scholastic Aptitude Test is a multiple choice test of verbal and mathematical abilities that is used to predict college performance. The verbal section includes questions on antonyms, analogies, sentence completion, and reading comprehension. The mathematics section contains problem-solving and quantitative-comparison questions. Also included are a test of Standard Written English and an experimental section.

High SAT scores can offset weak academic records, help students gain entry into prestigious colleges, and invite offers of scholarships. It's no wonder then that high schoolers and their parents are panicky about the exam.

Although SAT scores are supposed to reflect what students have learned over their entire school careers, the question of cramming for the test is a major issue. To guarantee at least a familiarity with the form of the test and the types of questions, many students find some way to prepare for the test. They select from review books, school and private preparatory classes, and individual tutoring.

Increasing numbers of students have also enlisted their computers to help them improve their SAT scores. Almost all of the SAT software packages provide diagnostic tests, drill exercises with explanations, projected SAT scores, and individualized study plans.

There are certain advantages to studying for the exam on a computer. The motivation of the machine itself, the single-item display, instant feedback, diagnostic capability, and selective drills and tutorials all comprise a sophisticated method of learning.

When students answer questions incorrectly, on-screen hints lead them to reevaluate their thinking so that they learn from their mistakes. They begin to understand the logic of the correct response and learn how to approach similar questions. For some, this immediate tutoring far outweighs reading a whole page of printed answers in a review book.

(Note: All of the following SAT packages were reviewed on an Apple IIe. Versions for other computers may vary.)

COMPUTER PREPARATION FOR THE SAT

For Laurie Sexton, a junior at Marymount College, the Harcourt, Brace, and Jovanovich (HBJ) program, *Computer Preparation for the SAT*, was what she wanted. From the time she cried over her initial PSAT scores until she saw a 100-point gain on the SAT, she drilled on the computer. Sexton claims, "I took the tests over and over and saw my computer scores predict how I was improving."

Marc Hirschfield, a sophomore at the University of Arizona, also used the HBJ program. While many of his friends took coaching courses, Marc feels that his 120-point increase is higher than their gains. Hirschfield says, "I love the computer and can sit for hours at it, so I know I studied more for the SAT with the computer program than if I had used a book."

The HBJ software combines old and new methods of test-taking and study. The questions appear in the book and students fill in an on-screen answer sheet. They must turn back and forth, but the computer does the scoring and provides an individualized study plan. Students take up to five practice tests, see their performance evaluated in each of 15 specific skill areas, and practice the skills to which the program assigns the highest priority. Students decide when they want to see details about the answers, and they have an additional 1,000 computerized flashcards to help them study. Unfortunately, the explanations are often too simple and do not provide a real analysis of the question, the answer, or the student response.

GWEN SOLOMON *is computer coordinator for Adlai E. Stevenson High School in The Bronx, NY. Her book,* Children, Writing, & Computers, *was published earlier this year by Prentice-Hall.*

Harcourt, Brace, and Jovanovich, (619) 231-6616 & (800) 543-1918. Apple, IBM PC/PCjr. $40.

COMPUTER STUDY PROGRAM FOR THE SAT

Other publishers known for traditional test preparation materials now provide computer study plans for the SAT as well. For Rima Ramirez, a freshman at the State University of New York at Purchase, using Barron's *Computer Study Program for the SAT* was a vast improvement over studying from a review book. Ramirez gained 120 points by practicing every weekend for a month prior to her test. She says, "With this program, I got hints and answers right away instead of having to look everything up. They're the same questions as in the book, but the program explained why I got things wrong."

In one of the most logically organized, thorough, and cost-effective programs available, Barron's offers students a choice of study plans. They can select the two-day crash program, the two-week concentrated plan, or the 10-week comprehensive program.

Students take a diagnostic test and two timed, simulated SAT exams that provide them with scores, an overall analysis of strengths and weaknesses, and individualized study plans. They review their answers one at a time and then progress to the hundreds of practice questions and drill exercises on disk. Also, there are math formulas, facts, and 101 often-repeated vocabulary words.

The documentation is well-written, helpful, and clear, and the on-screen messages are concise and easy to follow. The study questions are excellent, and the explanations are logical and comprehensive. The only drawback is the "raspberry" sound for incorrect answers.

Barron's, (516) 921-8750. Apple, C 64/128, IBM PC/PCjr. $50.

LOVEJOY'S PREPARATION FOR THE SAT

Another college-oriented publisher offers *Lovejoy's Preparation for the SAT*, which contains two complete tests, 27 practice topics, clear documentation, and a copy of the book, *Lovejoy's Concise College Guide*.

Students time themselves on each SAT segment; they can skip questions and change answers easily. The program evaluates their performance and displays scores on-screen in addition to logging them on a scoring disk.

The screen display in this program could be clearer. The instructions on how to move around in the program to read passages, to answer questions, and to flip to a previous question appear on the screen at all times; thus they are distracting. In addition, although the commands are consistent throughout the program, they are initially confusing.

When students review answers, the commentary appears at the top of the screen, rather than below the question. Student responses are shown, but for reading passages, students must scroll through on-screen paragraphs to find the correct answers.

Unusual features of this software include a scratchpad for taking notes and an on-screen calculator for math problems that can be used only in practice mode, not in test mode (calculators aren't allowed during the SAT).

Simon & Schuster, (212) 333-5800. Apple, C 64/128, IBM PC/PCjr. $50-$60.

SAT SUCCESS FOR MICROS

Peterson's *SAT Success for Micros*, the newest package reviewed here, also combines the traditional review book with computer-assisted instruction. Students take two simulated diagnostic tests from the book and enter their answers on-screen.

Individualized study plans include three levels of difficulty and a separate review book. Also included in the software are strategies for getting the right answer.

As the students work through the skill activity questions in the tutorial mode and the practice test, they get a thorough explanation of the right answers and a valuable analysis of their incorrect responses. They complete the course of study with two comprehensive tests.

Peterson's Guides, (609) 924-5338 & (800) 225-0261. Apple. $80.

SCORE IMPROVEMENT SYSTEM FOR THE SAT

Sean Veder, a freshman at Yale, used Hayden's *Score Improvement System for the SAT*. Veder increased his scores by 60 points, but gave up on the computer because he views it as a tool for writing, not for studying. He enrolled in a private review course and was happier carrying around the preparation book than having to plug into a computer.

The Hayden package, however, is an extremely ambitious and comprehensive program. Detailed advice, both in the manual and on-screen, can help students focus on a specific method of study.

Diagnostic tests lead students to a detailed analysis of strengths and weaknesses and to a series of tutorial programs. Students elect to answer the questions with or without "tutor-mode," a system of immediate feedback with detailed explanations of how to arrive at the correct answer. The explanations are thorough, but so wordy that the screen display is sometimes overwhelming.

Spinnaker/Hayden Software, (617) 494-1200. Apple, Atari XL, C 64/128, IBM PC/PCjr, Macintosh. $40-$100. BASIC language cartridge required for Atari and IBM PCjr.

OWLCAT SAT PREPARATORY COURSE

Another SAT program with a crowded screen display is Digital Research's *Owlcat SAT Preparatory Course*. This software (we

looked at the full 60-hour package) includes a few unusual features, such as an electronic dictionary; review, omit, and replay possibilities; sound capability; congratulatory messages; an SAT scorecard; and an SAT game.

The program offers problem-solving advice and numerous questions for practice. Both correct answers and wrong choices are explained. However, on the Apple, the numerous instruction screens, on-disk manual, and reading passages are in upper case letters and 40-column format, which makes reading the screen difficult.

There are other problems: The questions tend to repeat too often and the frequent disk-accessing wastes time; it takes too long to load portions of the program, and the buzzer that signals wrong answers can be annoying.

Digital Research, (408) 649-3896. Apple, C 64/128, IBM PC/PCjr. $90 (15-hour package); $250 (60-hour package).

MASTERING THE SAT

Written by educators from the National Association of Secondary School Principals, *Mastering the SAT* from CBS Software is well thought out and well designed. It includes a pretest, learning modules, and a post-test. The documentation also includes additional testing materials and advice on how to study.

Most outstanding in this program are the explanations of correct answers offered for test questions and throughout the tutorials. Students understand why their answer was wrong in addition to why the right answer was correct. The only drawback is that once students select an answer, they can't change their minds.

Matthew Dubin, a senior at Clarkstown North High School in suburban New York, is using this package to supplement a preparatory course. "The program," states Dubin, "makes it more fun to study than flipping pages in the review book." Dubin, determined to be accepted into Wharton (University of Pennsylvania's business school), began studying in his junior year; he's already increased his score 100 points and is still working.

CBS Software, (203) 622-2614. Amiga, Apple, C 64/128, IBM PC/PCjr, 512K Macintosh. $80-$100.

SAT WORD ATTACK SKILLS & PSAT/SAT ANALOGIES

Janice McNeill, an independent college counselor in San Diego, encouraged her son Scott to begin studying for the SAT when he entered the tenth grade. McNeill believes that youngsters can make real improvements in vocabulary and math skills only by studying over a long period of time instead of cramming.

Used over time, programs such as EduWare's study programs for the PSAT and SAT can help students to improve basic skills. Both *PSAT/SAT Analogies* and *SAT Word Attack Skills* are well designed, and while they do not follow the format of the SAT as precisely as other SAT software, they provide excellent vocabulary practice. In addition, students can add their own words for review.

SAT Word Attack Skills reinforces specific skills such as understanding definitions, connotations, roots, prefixes, and suffixes, word analysis, synonyms and antonyms. *PSAT/SAT Analogies* deals with word relationships and meanings. Both programs include an instruction mode, a test mode, and a timed test mode. The screen displays are clear, the documentation helpful, and the explanations logical, even if they do not parallel the precise thinking of the SAT exam.

EduWare, (415) 546-1866. Apple. $30 (Word Attack Skills); $30 (Analogies).

THE PERFECT SCORE

The Perfect Score from Mindscape will also help students improve SAT-type skills. There are 100 questions for each area necessary for the exam. Students can opt to answer in a testing module, where the answers are scored at the end of 10 questions, or in a learning module, where there is immediate feedback for each question as it is answered. Random selection allows students to see the questions in different order each time they run the program; however, in the testing mode, the logic of correct answers is never explained.

Mindscape, (312) 480-7667. Amiga, Apple, C 64/128, IBM PC/PCjr, Macintosh. $70-$80.

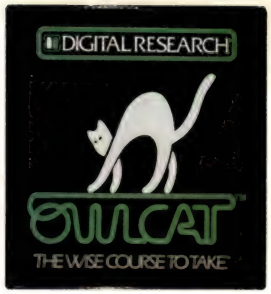
PREPARING FOR THE SAT AND OTHER APTITUDE TESTS

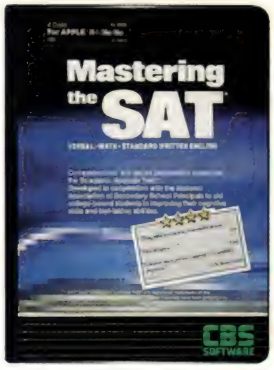
Program Design International's *Preparing For the SAT and Other Aptitude Tests* is another example of advance-planning software. An audio cassette tape keyed to a disk introduces the program and provides information on test-taking strategies, time management, and SAT myths. Other disks include tutorial and practice activities and one manual, "Making the Grade," gives advice on how to study and pass a test.

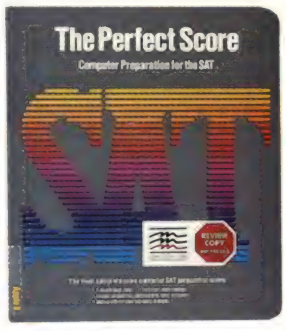
This program contains an on-disk timer, but does not include diagnostic or practice tests. Students learn to analyze questions by type and gain insights into test taking. Skills activities are almost pure drill, and explanations are kept to a minimum. Advice refers students to the manual instead of to on-disk tutorials. It would be better if it were more disk-based.

Program Design International, (800) 232-2224. Apple, Atari, C 64/128. $70.

Every year, thousands of students weigh the alternatives and decide how to approach the SAT. More and more teenagers, faced with the tedium of studying for this exam, seek an interesting and effective method of reviewing and gaining confidence. They feel that using their home computers and SAT software is the way to go.







BY NICK SULLIVAN

NUMBER FIVE IN THE APPLE II LINE DELIVERS IMPROVED SOUND AND GRAPHICS

"THERE'S GOING TO BE SOME GREAT MULTIPLAYER GAMES AND EDUCATIONAL SIMULATIONS."
DAVE CÔTÉ
CONSUMER
MARKETING
MANAGER

The Apple IIGS is a true family computer—it has the horsepower to do business tasks as well as education," says John Sculley, chief executive officer of Apple. "With the IIc, IIe, and IIGS, we've now got a good-better-best lineup."

In its heyday, the Apple II was the champ for games, education, and business. But even though buoyed slightly by the success of *AppleWorks*, its role as a top-ranking business machine has been usurped by the IBM PC and compatibles. And next to the new 68000 machines (Atari ST, Amiga, Macintosh), the II's technology seems iron-deficient. Can it ride again?

Yes. Because the IIGS takes the best elements of all the Apple designs and adds new flourishes that bring it up to the speed of its flashy competition. "With the IIGS, we are iterating and innovating," says Randy Battat, product manager.

This is not a product review of the new computer, but a preview of what to expect based on a day spent viewing a preproduction model at Apple headquarters and at an informal luncheon discussion with CEO John Sculley and other Apple executives.

NICK SULLIVAN *is senior editor at* FAMILY COMPUTING. *He has used Apple computers for six years.*

WOLF'S CLOTHING

The IIGS package (GS stands for graphics, sound, and speed) comes with a 256K system unit, detachable keyboard, and mouse. Monitor and disk drive(s) will generally be sold as separate items. The IIGS can play 15 musical voices simultaneously. It can display 4,096 colors (although not at once), and has a super high-resolution mode in color. Its microprocessor is nearly three times faster than that of the IIe and IIc, and it's capable of addressing more memory (up to 8 megabytes). The keyboard includes a numeric keypad, the first 8-bit Apple since the short-lived Apple I to incorporate such a business tool. The IIGS is indeed an Apple II in wolf's clothing!

NONDISPOSABLE TECHNOLOGY

But it is an Apple II. Besides new software with advanced color and sound and screen displays, the IIGS will be able to run most Apple II

PHOTOGRAPHS BY ROGER RESSMEYER/STARLIGHT

software, some of which is nearly 10 years old. Much of this software will run nearly three times as fast on the IIGS.

In addition, virtually all existing Apple peripherals will work on the IIGS, which is why you'll be able to buy it without a disk drive or monitor—people might want to use their old equipment.

As further proof that technology doesn't have to be disposable, Apple IIe owners can upgrade their machines to IIGS's by replacing the main "logic" boards. One purpose for this design is to give schools, which have about 750,000 IIe's in place, an "upward growth path." I also suspect that Apple wanted to give all IIe owners a compelling reason not to buy MS-DOS machines. "Schools have standardized on the Apple IIe, but they show palpable MS-DOS concern," says Betsy Pace, Apple's K-12 marketing manager.

Apple IIc owners cannot upgrade their machines (just as II Plus owners could not upgrade to a IIe), but they can expand the memory to 1 megabyte using a new memory expansion board. With this configuration and the new version of *AppleWorks* (2.0, which now includes a mail-merge function and the capacity for bigger files), IIc owners will be able to run the popular program with one disk drive and have a "desktop" of 1012K.

THE RETURN OF THE SLOTS

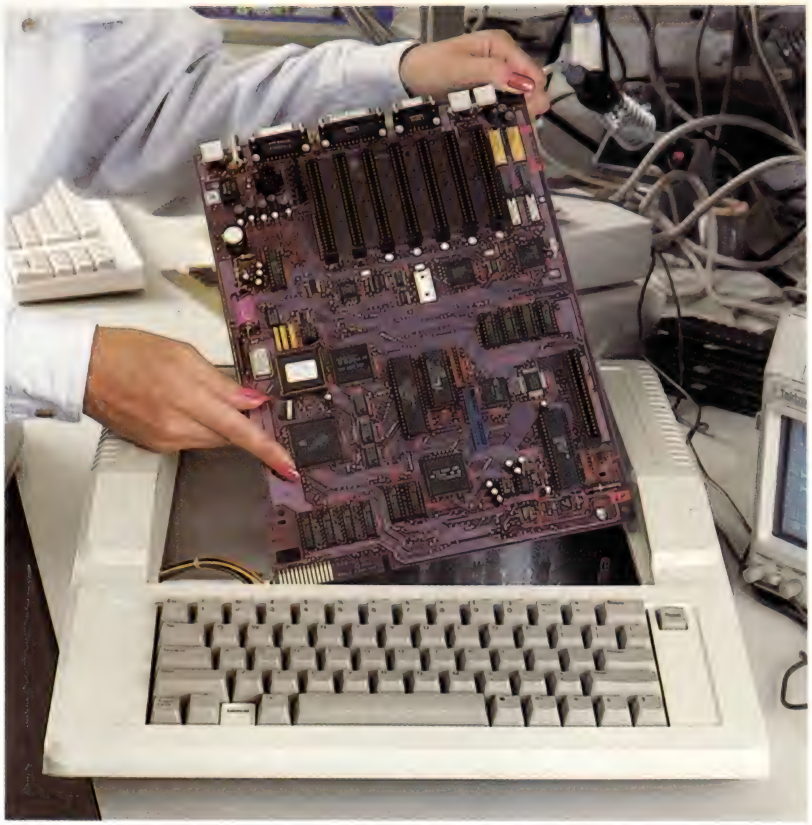
Like the IIe, the GS has eight slots for expansion cards—a return to the famed open system that was once Apple's hallmark. (The Apple IIc and Macintosh are closed systems that the user cannot easily expand.) One slot is reserved for memory expansion—both RAM and ROM. All existing cards that work on the IIe should work on the IIGS.

For instance, you can run a parallel printer on the IIGS by inserting the proper interface card; on the IIc and Macintosh, there is no parallel interface. And you can use Apple II drives on the IIGS by putting the controller card into ol' slot 6.

Like the IIc, the IIGS has built-in connectors on its back panel. So, while you can use the open slots to expand your system, you won't have to fiddle with circuit cards to connect standard peripherals. The keyboard plugs into the back, and mice or joysticks can be plugged into either end of the keyboard. Great for lefties!

The newer eight-pin Macintosh-style serial ports allow you to plug in a modem, an ImageWriter II or LaserWriter printer, or any other serial-interfaced printer. The SmartPort can handle either 3.5-inch or 5.25-inch disk drives. An RGB port marks another first for Apple. And, like the IIc, the IIGS has a nine-pin joystick port and a sound port to connect headphones or speakers.

Like the Macintosh, the IIGS comes with a mouse. Built-in program routines make it easy for programmers to use pull-down menus and



Want a souped-up computer? Turn your Apple IIe into a IIGS by replacing the main system board and backplane.

APPLE IIGS FACTS

PRICE: Not available at press time. Estimates run at under $1,000 for system (CPU), keyboard, and mouse. Disk drive and monochrome monitor will be sold separately.
RAM: 256K, expandable to 8 megabytes.
ROM: 128K, expandable to 1 megabyte.
EXPANSION SLOTS: 7 input/output slots; 1 dedicated RAM/ROM memory expansion slot.
GRAPHICS DISPLAY: Apple II 40- and 80-column text displays, and Apple II low-resolution, high-resolution, and double high-resolution graphics modes. Apple IIGS super high-resolution graphics mode (320 x 200 resolution, with 256 colors on-screen out of 4,096; or 640 x 200 resolution, with 64 colors on-screen out of 4,096).
KEYBOARD: Detached typewriter-style keyboard, with 10-key numeric keypad.
SOUND: 15 voices (Ensoniq synthesizer chip has 64K dedicated RAM).
INTERFACES: NTSC composite video (color or monochrome), analog RGB video, headphone jack, keyboard, SmartPort for connecting both 5.25- and 3.5-inch disk drives, two 8-pin serial ports, 9-pin game/joystick port, and input/output sound connector on logic board.
SPECIAL FEATURES: Built-in, real-time battery-powered clock. AppleTalk local-area network interface. Can run most existing Apple software at regular speed or at faster IIGS speed. Can "daisy chain" up to 16 joysticks, mice, or other input devices off keyboard, via Apple Desktop Bus.

"THE MAC AND II LINES LOOK SIMILAR NOW, SO HOW DOES THE CONSUMER DECIDE? THE FUNDAMENTAL DIFFERENCE IS SOFTWARE."
TOM VIRDEN
MARKETING
MANAGER

With the New Apple Super High-Resolution RGB monitor, the IIGS looks like a color Macintosh.

icons—so GS-specific software will look much like Mac software. The IIGS incorporates other routines in ROM that work like Macintosh's *QuickDraw*, part of the system software that can quickly sketch or paint graphics on the screen.

SOFTWARE

Because the IIGS is a hybrid of two well supported machines—part II, part Mac—new software is likely to flow like wine at a wedding. The legions of experienced Apple II software developers should have little trouble writing snazzy new programs for the IIGS, or even upgrading existing products to take advantage of its color, sound, and speed.

And Macintosh developers, who struggled to learn that machine, will be tempted to rewrite Mac programs to take advantage of the IIGS' Mac-like features—and color.

"WITH THE IIGS ON THE MARKET, THE MACINTOSH WOULD BE AT RISK, WERE IT NOT SHOWING SOME SUCCESS IN THE BUSINESS MARKET."
JOHN SCULLEY
CHIEF EXECUTIVE OFFICER

"In some ways, the color Mac that people have been clamoring for has been implemented," says CEO Sculley, who has been affectionately dubbed "The Skull Man" by a San Francisco radio station for his often thought-provoking comments.

NEW GRAPHICS AND SOUND

How will new software look and sound on the IIGS? We can only guess, because at press time no new software was ready for release. However, to judge from works-in-progress, the IIGS screen display does indeed look like a Macintosh with color. It has a menu bar across the top of the screen, which gives you pull-down menus, and icons—just like a Mac. In fact, the new Apple RGB monitor, which plugs right into the back without an additional interface, may give some Mac fans buyer's remorse.

In the top resolution (640 x 200), what Apple calls Super High Resolution, good programmers will be able to get up to 64 colors on screen at once. Many users are finding that a judicious use of color in applications software makes it easier on the eyes. It's interesting that the monochrome resolution is no better than the color—this machine is obviously designed to be used as a color system. However, Apple also has a new high-resolution white-phosphor (as contrasted to green) monochrome monitor.

The sound capability of the IIGS may turn out to be its future cornerstone. On the main logic board there's an "input/output sound connector," and one can only guess what people will plug in. Few other computers can play 15 sounds, voices, or instruments at once. The famed SID (Sound Interface Device) chip on the Commodore 64, for instance, plays three voices. As it happens, the Ensoniq synthesizer used in the IIGS was developed by many of the same engineers who developed Commodore's SID chip.

WHERE'S THE RUB?

Obviously, Apple listed all the faults of the IIe and IIc, and tried to rectify them as best they could and still stay compatible with Apple II software and hardware. The new computer—under various guises called the IIx, Rambo, and Cortland—was in development for three years, and the work shows. The Apple IIGS is a logical and pragmatic system.

There are just two minor drawbacks. The lack of a built-in parallel port (no Apple computer except the Lisa has ever had one) means the extra expense of an interface card for parallel printers. Fortunately, there are a number of fine serial printers around, such as the Apple ImageWriter II. Second, the built-in speaker is very primitive and cannot do justice to the great music the computer is capable of producing. "It's like listening to a transistor radio," says Neal Amsden, an Apple manager. On the other hand, no one says this is a stereo system (although you can output sound through your stereo).

Depending on pricing, which was uncertain at press time, the IIGS will appeal to several groups. Schools, of course, will see the new Apple as a reaffirmation of its commitment to the education market. So will parents with school-age children, traditional Apple buyers. And many Apple IIe owners will be overjoyed that they can upgrade to a flashy new machine while still protecting much of their investment in software and hardware.

What about new converts for Apple? "I think the great sound of the IIGS will attract new buyers," says Dave Côté, consumer marketing manager. And people who are tempted by flashier 68000 machines might opt for the "security blanket" of an Apple II that will be supported for years.

But say your children use Apples in school, and you use an IBM at work. What do you buy for home—an Apple IIGS, or an IBM compatible? Ay, there's the rub. FC

Nancy Salyer
Laser Link
Union City, California

Setting Up a New Business

A CASE STUDY ON MARKETING A SERVICE, PLANNING FOR EXPANSION, AND BUILDING ON YOUR OWN STRENGTHS

BY MICHAEL C. THOMSETT

In 1.1 million home offices across the country, the American Dream is alive and well. Disk drives whir, printers churn out documents, and mail boxes fill with payments for services and products created by people who've taught themselves the nuts and bolts of running a business—entrepreneurs who find joy in their independence from the "daily grind." Although most of these folks will find their formulas for success *without* the benefit of a Harvard Business School MBA, there are a few basic tenets that can speed the process—as Nancy Salyer of Union City, California, is finding out.

Salyer started a home-based secretarial service this year. (She had been in business one month at the time this story was prepared.) She works in an 8 x 8-foot room in her house, where there is just enough room for a couch, a desk, a chair, an IBM PC, a Compaq backup system, and two printers, one a dot-matrix and the other a Juki letter-quality model.

Before the home business bug bit her, Salyer had worked as an executive secretary for a sales manager with an electronics company in California's Silicon Valley. Prior to that, she gained six years' experience in the customer-service field.

When I spoke with her, Salyer had generated only one invoice, a billing for the letters and mailing list she'd prepared for her client, an auto parts house that was referred to her by another secretarial service in the community. She asked me to evaluate seven major elements of her business and to make suggestions for improvement. The following is a case study of a business in its formative stages, with a look at a business's name, pricing policies, the physical setup of an office, plans for expansion, ways to build clientele and benefit from the competition, and sources of help for small business owners.

FACTOR 1: Naming the Business

SITUATION: Salyer plans to purchase a laser printer within the next two years to become proficient at desktop publishing and to produce typeset-quality documents for clients. With this in mind, she has named her company Laser-Link.

EVALUATION: Choosing the name Laser-Link is a forward-looking idea, assuming that Salyer

PHOTOGRAPHS BY ROGER RESSMEYER/STARLIGHT

RESOURCES

ASSOCIATIONS

American Management Association
135 West 50th Street
New York, NY 10020
(212) 586-8100
Individual membership $125/yr. Has personal computer seminars nationwide. For information call (212) 903-8208.

Institute of Management Sciences
290 Westminister Street
Providence, RI 02903
(401) 274-2525
Membership $36/yr. Professional society. Meets twice a year. Publications available.

International Entrepreneur's Association
2311 Pontius Avenue
Los Angeles, CA 90064
(213) 473-0838
Membership $25/yr. Publishes *Entrepreneur* magazine. Seminars nationwide.

U.S. Chamber of Commerce
1615 H Street NW
Washington, DC 20062
(202) 659-6000
Membership $125/yr. Publishes *Nation's Business* and *The Business Advocate*

OTHER RESOURCES

U.S. Small Business Administration
Answer Desk
Washington, DC 20416
(800) 368-5855
Publications available.

Consumer Information Center
P.O. Box 100
Pueblo, CO 81022
Free catalog of free and low-cost booklets.

Superintendent of Documents
U.S. Government Printing Office
Washington, DC 20402
Free catalog of U.S. Government books for sale.

stays with the plan for desktop publishing. But what if her plans change?

The name does not describe what she offers (or plans to offer), even if she does acquire a laser printer, except to a very limited market. Before she's locked into the name Laser-Link, she should consider developing a more universal, recognizable company name. Also, when choosing a name for your company, check to make sure it's not already copyrighted by another business, or you could find yourself needing legal counsel!

FACTOR 2: Building Clientele

SITUATION: Salyer would like to build her business over time, with a specialization in providing newsletter services to multi-branch organizations. She explains, "I envision that an organization with a local chapter will want input from other chapters around the country." Likely clients include professional associations and fraternal groups, such as the Rotary Club, Chamber of Commerce, or a local union.

She says, "I want to stay small for the first couple of years because of my children [ages 6 months and 2 years]. But once they get old enough to be in school, I'd like to expand and offer networking as well as secretarial work."

She defines "small" as having 10 or fewer clients, each providing her with an average of $100 gross income per month.

EVALUATION: Since Salyer's family is not dependent on her income, she can afford to build the business over time, and that's a considerable advantage over someone who, as sole supporter of a family, must risk everything to start a business. And an additional $1,000 per month is a solid second income for *any* household.

Salyer can contact many new businesses by reading the daily paper and contacting everyone who places a fictitious-name legal notice (the notice required by anyone starting a business). For each one, she should assemble a client cover letter and a business card. For anyone just starting out, this provides a compact and useful orientation kit.

To introduce her services, Salyer should compose an effective, one-page letter to use either when making personal contacts or as part of a direct-mail campaign. She needs to develop a client-contact program and a follow-up procedure. Her word-processing software (*WordStar*) can aid in the development of personalized form letters.

FACTOR 3: Pricing Policies

SITUATION: Salyer structured her initial fee at $15 per hour for typing and word processing.

As she explained, "I'm billing that as an introductory rate. I'm not putting a time limit on it, but I may change it in three to six months."

EVALUATION: Pricing can generate the most squeamish feelings in people starting a new business. There you are, unsure about how well you're going to do, with only one client, trying to decide how much to charge.

But, there is a problem with an introductory program. When Salyer tries to increase her rates, she may find that clients resist. If her services are worth more, she should increase her initial rates and charge for what her services are worth, at the outset.

FACTOR 4: The Office Environment

SITUATION: Because her dedicated home office is so small, it isn't practical for Salyer to meet with clients at home. She consequently picks up and delivers work. "I do see myself getting an outside office, perhaps in two years," she says, although she has not yet looked into the cost of renting office space.

The greatest problem of working at home, says Salyer, is that when people call on the telephone, young children can interrupt. "I really want to present a professional image," she says. "It doesn't help when people find out they're calling my home."

Salyer does have a separate business telephone in her home and an answering machine. That way, she is able to separate business and personal calls. She also has the choice of whether to take calls after 5 p.m.

EVALUATION: While working at home is an advantage for Salyer as long as her children are young, it is a disadvantage for a secretarial service, and her concern about professional image is well founded. Business people who have outside stores and offices often prefer working with others who have made the commitment to "setting up shop."

For anyone who works at home and deals with clients in offices, image is a serious issue. Many people view home-based businesses as less than professional and their owners as being uncommitted. Although background noise and the distraction of working from home are probably more bothersome to Salyer than they are to her clients, the situation does present a serious problem.

Salyer has set her priority: to raise her two children to the point that they will be in day care during business hours. But since her phone is answered by a machine even during the day, the question should be asked: Does that make an equally poor impression?

A suggestion for compromise: The telephone should be answered, even when the children are present. As a home-based business owner, you can arrange to return calls within the day. That's preferable to relying on an answering machine that offers no guarantee that callers will indeed leave messages.

Some businesses can operate indefinitely at home. However, a secretarial service like Salyer's may eventually grow to the point where outside facilities are demanded. There's not much she can do to improve the use of space in her home. If she expects any long-term growth, however, she must recognize that a limited work area inhibits her ability to expand.

When you realize that moving out of a home office is inevitable, you should begin investigating the costs of expansion, including leases, insurance, the cost of utilities, and all other factors involved in opening an outside business.

FACTOR 5: Competition

SITUATION: When she began sizing up the competition and determining the market niche her business would serve, Salyer contacted several other secretarial services in her community. This is a smart move for a number of reasons.

EVALUATION: When you start a new business, contact with competition can be the most important move you make. Salyer's first client came from such a referral and since that time, the same service has referred a good deal of overload work to her.

Competitors may call upon you to back them up when they're out of town. And, Salyer points out, if your equipment goes down, you'd better have a backup system nearby where you can complete clients' work.

And remember, it doesn't hurt to know what the competition is offering. It'll help you direct your marketing efforts, and you'll be able to present the advantages your business offers to prospective customers.

FACTOR 6: Expansion Plans

SITUATION: Salyer explains that she wants to sell services and spend her time managing and expanding her business. "I want to get it to the point where I can get an outside office and hire other people to do the work for me."

Salyer plans to upgrade her 256K IBM by adding a 20-megabyte hard disk in the near future, and she plans on hooking up to a laser printer.

EVALUATION: New business owners are often reluctant to delegate work or even to consider hiring other people to work for them. Salyer, however, sees the real pleasure in marketing and managing, and that's a sign she's on the right track.

Any business owner will discover that with three or more employees on staff, he or she no longer has the time to do routine work. This is a necessary fact in the growth of an organization, and it's where you find out whether you really have the ability to manage an operation.

Because she's already thought about upgrading her equipment, Salyer will not be surprised by the need to invest in increased computer power when the time comes to do so.

FACTOR 7: Getting Help

SITUATION: Even though she's just starting out, Salyer has a jump on many new business owners. She is experienced in word processing, a skill she learned in her previous occupation.

But in the areas of promotion and marketing, Salyer is not as experienced. She has done some cold calling on local businesses, and it's too soon to tell how successful that will be.

EVALUATION: It is always valuable for a new business owner to locate and join an association or other group of people in similar businesses. *(See accompanying boxes for resources and associations for small business owners.)*

Salyer is fortunate, because there are two organizations she can join. One is the National Association of Secretarial Services (NASS), headquartered in St. Petersburg, Florida, and the other is the Professional Association of Secretarial Services (PASS), located in the San Francisco Bay Area.

NASS sponsors national seminars and publishes a newsletter and books especially for owners of businesses like Salyer's. As a new owner of a service, the support and contacts a start-up business gains from NASS membership is invaluable.

PASS is a more localized organization, with membership in California, Arizona and Nevada. It, too, can assist Salyer, especially while she is developing her new business from a home base.

You may also consider hiring a consultant. There are all sorts of planning observations an outsider can make. For many people in the same position as Salyer, there is a benefit in hiring a business consultant. The biggest problem with that idea is finding one with the experience and knowledge to really help.

A consultant who is able to observe the status of a new business and make suggestions for practical matters—planning, marketing, pricing policies—is also a worthwhile investment. Salyer may want to consider retaining a consultant in the future, especially at key decision points, such as just before she plans to begin a major marketing thrust, buy new hardware, or move to an outside office.

You should also plan to spend no less than 30 minutes per day thinking about and planning your future. Salyer can construct a simple chart that sets the goal of getting one new client per month, for example. Then she can plot her progress on the chart.

LOOKING AHEAD

As a result of the interview for this article, Salyer made four significant business decisions:

- She has put together an introductory folder for contact with new business prospects.
- Abandoning the idea of an introductory rate, she has now set her fee at $20 per hour.
- Plans for upgrading her computer system are in the works, and she's investigating the costs of setting up an outside office.
- She has joined the National Association of Secretarial Services.

In addition to looking ahead and planning her business development, Salyer has already demonstrated an important trait that points to her future success: the flexibility to change her mind. And she will discover, as many others have, that people who set goals reach them. FC

RESOURCES

BOOKS

Entrepreneurial Workbook, C. Taylor, New American Library, $9.95

How to Make Your Home-Based Business Grow, V. Bohigan, New American Library, $3.95

How to Manage Your Small Computer, H. Segal and J. Berst, Prentice-Hall, $14.95

How to Start, Expand, and Sell a Business, J. Cominskey, Venture Perspectives Press, $17.95

How to Start and Manage Your Own Business, G. Greene, New American Library, $12.95

#1 Home Business Book, G. and S. Delany, Liberty Publishing Co., $4.95

Small-Time Operator, B. Kamoroff, Bell Springs Publishers, $9.95

Working From Home, P. and S. Edwards, Jeremy P. Tarcher, Inc., $10.95

Nancy Salyer of Laser-Link with consultant Michael Thomsett

MICHAEL THOMSETT *writes for a number of national magazines and is working on his ninth book, an encyclopedia for office managers being published by Prentice-Hall. Thomsett is also a financial services and accounting consultant and in that capacity, he undertook an analysis of Nancy Salyer's new secretarial business.*

GUIDE TO WRITING WITH COMPUTERS, PART III

Search and Replace Makes Writing Easier

BY DAVID HALLERMAN

Back in great-grandfather's day, when the automobile was still young, people stopped talking about "making a journey to Cincinnati" and began speaking of "making an *automobile* journey to Cincinnati." After a decade or two, when folks grew accustomed to cars, they reverted to the older terminology and simply made "a journey to Cincinnati" once again.

So it is with writing with computers. Before people began laying their fingers on computer keyboards, they wrote. Whether with pens or typewriters, they wrote. It didn't matter if they produced letters, book reports, or novels—they wrote. Yet with computers, people sometimes forget they're still writing; rather, they "process words."

But a journey is a journey, and writing is writing, no matter what the vehicle. Of course, there have been a few changes along the way. Just as you now have hundreds of horses under the hood instead of one or two pulling the buggy, your word-processing program offers dozens of extra features for writing, extras that also make word processors harder to master than earlier writing tools. That's why this series continues with hints for using various word-processing functions. As you gain greater control over your program, running it won't steal attention from thinking about what you want to say and how you want to say it.

Among the extras that deliver a type of help for writing that never existed before is the SEARCH and REPLACE team. From a rough outline of your first thoughts to editing your final draft, SEARCH and REPLACE can do more than initially might be apparent.

HOW SEARCH AND REPLACE WORKS

SEARCH (or FIND) and REPLACE are two closely related, but distinct, functions: SEARCH can operate by itself, but REPLACE must work along with a SEARCH. Almost every word processor has some form of SEARCH and REPLACE, and they operate similarly. After invoking the SEARCH command, you're asked which characters you want to find. Then, if you want to replace those characters, you type in the new text as well.

Let's say you've written a nine-page essay about your love for baseball. On reflection, you realize that *home run* is a clearer expression than the antiquated term you've written, *four-sacker*. While you could scroll through your draft line by line, scanning for each appearance of *four-sacker*, deleting it, and typing its replacement, the SEARCH function makes it easier. With *Apple Writer* (Apple Computer), for example, you'd just press CONTROL-F (F as in FIND) to invoke the SEARCH prompt. Then you'd tell the program to look for all instances of *four-sacker*. As you found each one, you could remove it and type *home run* in its place. This could grow tedious.

Adding REPLACE to SEARCH, though, makes it a whole other ball game. When paired, SEARCH and REPLACE give you two options: automatic or selective. To wit: What if you needed to search for *cat* and change it to *dog*? With automatic SEARCH and REPLACE (sometimes called "global"), the program looks for the letters *cat*, and replaces them with *dog* throughout the document. That's fine for felines and canines—and would probably work well for our

ILLUSTRATION BY DEBRA WHITE

DAVID HALLERMAN is *reviews editor for* FAMILY COMPUTING.

home run example above—but a word like *catastrophe* would become *dogastrophe*. On the other hand, a selective SEARCH and REPLACE lets you stop at each mention of *cat* and determine whether or not to replace it with *dog*. (*For another solution, see technique No. 1, below.*)

Many word processors' SEARCH and REPLACE modes are case-sensitive. That is, if you told one to search for *take*, it wouldn't find *Take* (with an uppercase "*T*") in a sentence such as, "Take a walk with me, darling." The wild card is another feature that's part of some SEARCH functions. For example, with the asterisk (*) as a wild card, a search for *ex*** would find *extra*, *exile*, *exude*, or any other five-letter word that begins with *ex*.

SEARCH-AND-REPLACE TECHNIQUES

When you examine SEARCH and REPLACE, you'll find many ways of using the duo to help with writing. Here are nine useful tips:

1 Like other computer functions, SEARCH and REPLACE do only what you tell them to. So if you look for all occurrences of the word *be*, you'll also uncover words like *beyond*, *aberration*, and *lobe*, since each contains the letters *be*. If you want to find just the word *be*, however, you'll have to tell your word processor to search for only those instances of *be* that have a space before and after the word. Thus, your computer will not bother to point out instances of *be* that are embedded in a word. Even then, you would not find *be* followed by a comma or period, as in "To be, or not to be." You would have to perform a separate search. Learn to be exact when searching.

2 In a seeming paradox, however, you don't always need to be complete. You can often type just part of a word to search for it. For instance, to find *nothing*, a search for the letters *noth* would probably be sufficient, since few words contain this combination of letters.

3 Speaking of nothing, the idea that you can replace something with nothing may seem foreign to word-processing novices. But it's simple to use the global replace function to perform a global delete. Example? To transform *Jonathan* into *Jon*, search for *athan* and replace it with no text. You can also reverse the process, and replace nothing with something. One good use for this trick is for indenting paragraphs. Here, if your word processor allows it, search for the carriage return at the end of each paragraph and replace it with a carriage return and five trailing spaces. (Each press of the space bar generates a character.)

4 The easier it is to move around your text, the easier it is to edit. Would you like to be able to leap from paragraph to paragraph at a keystroke? If you indent each paragraph, you can search for those opening spaces and then repeat the search. Another paragraph-hopping method has you search for the carriage return (or other characters) that your word processor puts at the end of each paragraph. You can also jump from sentence to sentence by finding periods and thus (except for abbreviations) move to the end of each sentence.

5 One trick uses the SEARCH function as a marker in your text to help you return quickly to any particular spot in your document. Let's say you're writing your doctoral thesis. You're revising a sentence somewhere in the middle of chapter nine, but you also need to refer to the final paragraph in chapter five. Type a character you rarely use—such as a plus sign (+)—by that final paragraph. Then, as you revise your sentence, search for the +, and you'll be back at the text you want to refer to. When you no longer need the characters as place markers, search for each one and replace it with nothing.

6 Here's a real time-saver using SEARCH and REPLACE. When you are repeatedly using a long or complicated word, don't type it out in full. Substitute a shortened version instead. Say you're writing a report on dogs for your biology class. Why key in *Canis familiaris* (the genus and species) each time it's needed? You can just type *CF* as you write. When you've finished the paper, search for *CF* and replace it with the complete term. This technique also increases your spelling accuracy, since you have fewer chances to misspell complex words.

SEARCH CAN ALLOW ANY WORD PROCESSOR TO WORK LIKE A RUDIMENTARY DATA BASE.

7 SEARCH can allow any word processor to work like a rudimentary data base. For example, it's not hard to use your word processor to keep a name and address listing of friends and relatives. While you won't be able to sort (unless your word processor includes that function), you can search as needed. The ability to find text easily can also help you create outlines similar to ones you might make with a specialized outlining program such as *ThinkTank* (Living Videotext). When setting up your outline, place your key words at the beginning of each heading and capitalize them so they stand out from the rest of your text. If *SPORTS* was the marker for a main heading, for instance, a search would jump you to that section. Then you could use *BASEBALL* to head the next level down, *NATIONAL LEAGUE* as one of two heads for the third level, and so on.

8 If you want to exchange two words with each other, here's how. To replace every occurrence of *John* with *Carl* and vice-versa, you'd first replace every *John* with something like *CCC*. Then, replace every *Carl* with *John*. Finally, replace every *CCC* with *Carl*.

9 Many word processors offer embedded commands for telling your printer to center text, boldface or underline words, etc. These are special printer-control characters inserted in your text. While you could embed the commands as you write, it's often more convenient to use SEARCH and REPLACE after you're finished typing the text. For example, search for *Willie Mays* and replace his name with ^*Willie Mays*^ (or whatever commands your program and printer demand) to print in boldface.

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O C T O B E R

HALLOWEEN PROGRAM
Page 56

Will the werewolf blow his cover? Type in *Will the Werewolf* and find out.

HEALTH AND SAFETY QUIZ
Page 67

Is your family prepared in case of a fire? Find out with the *Fire Safety* quiz.

HOME HELPER PROGRAM
Page 73

Make a pint-sized recipe produce portions galore with *Cooking Calculator.*

MORE PROGRAMS IN K-POWER
Page 81

See *Frightening Lightning* and *Mouse in the Maze* or learn to control the filter in a Sound Interface Device chip with a joystick in Dr. Kursor

PROGRAMMING P.S. Page 71 **TIPS TO THE TYPIST** Page 80 How to type in FAMILY COMPUTING programs

ILLUSTRATION BY JIM CHERRY III

WILL THE WEREWOLF

BY JOEY LATIMER

Most people think of William B. Werewolf as an ordinary zookeeper. And they know that to earn some extra money, Will moonlights as a computer programmer. But they don't know that he never works on nights when the moon is full. You see, Will inherited a condition from his ancestors: The light from a full moon transforms him into a grisly, wild-eyed werewolf. As a child, he roamed the wooded hills behind the family farm whenever the moon was full, but now he locks himself in his room to avoid being seen.

One rainy, miserable night, Will gathered his computer disks and went to work. This particular night seemed no different from any other. He and his fellow hackers on the late shift played a battle simulation and then got to work. When Will began struggling with his latest programming problem, he noticed that the rain had stopped and the sky was clearing. As the clouds moved across the sky, out popped a bright, full moon. Will had forgotten the date and now it was too late. He suddenly changed into a werewolf. Then, when a cloud drifted across the moon, he went back to normal again. Will kept changing from human to werewolf until finally the thick cloud coverage returned. As for his friends in the computer lab? They were so involved with their programs that they never even noticed the werewolf in their midst!

If you'd like to see Will do his werewolf routine in low-resolution computer graphics, type the *Will The Werewolf* program into your computer, SAVE it to disk or cassette, and then RUN it. Use Will in a window on Halloween and your house could be the talk of the neighborhood!

Adam/*Werewolf*

```
10 DIM r%(532)
20 FOR i = 1 TO 532:READ r%(i):NEXT i
30 HOME:GR
40 fa = 1:GOSUB 1000
50 dr = 1000:GOSUB 2000
60 FOR x = 1 TO RND(1)*7+4
70 COLOR= 9:PLOT 16,14:PLOT 23,14
80 dr = 250:GOSUB 2000
90 COLOR= 6:PLOT 16,14:PLOT 23,14
100 dr = 1500:GOSUB 2000:NEXT x
110 COLOR= 15
120 FOR i = 0 TO 10 STEP 2:j = 6-i/2
130 HLIN 0,j AT i:HLIN 0,j AT i+1:NEXT i
140 dr = 750:GOSUB 2000
150 COLOR= 9:PLOT 16,14:PLOT 23,14
160 COLOR= 6:PLOT 15,14:PLOT 22,14
170 dr = 1000:GOSUB 2000
180 COLOR= 9:PLOT 15,14:PLOT 22,14
190 FOR de = 1 TO 60:COLOR= INT(RND(1)*9)+1
200 IF de = 60 THEN COLOR= 1
210 PLOT 16,14:PLOT 23,14:NEXT de
220 fa = 229:GOSUB 1000
230 COLOR= 8:VLIN 4,7 AT 8:VLIN 6,7 AT 9
240 VLIN 6,7 AT 30:VLIN 4,7 AT 31
250 COLOR= 15:PLOT 18,28:PLOT 18,29
260 PLOT 21,28:PLOT 21,29
270 tt = INT(RND(1)*400)+400
280 FOR de = 1 TO tt:COLOR= INT(RND(1)*15)+1
290 IF de = tt THEN COLOR= 1
300 PLOT 16,14:PLOT 23,14
310 NEXT de:GOTO 40
1000 FOR ro = 0 TO 39 STEP 2
1010 y = 0:FOR x = 1 TO r%(fa)
1020 COLOR= r%(fa+1):fa = fa+2
1030 HLIN y,y+r%(fa)-1 AT ro
1040 HLIN y,y+r%(fa)-1 AT ro+1
1050 y = y+r%(fa):NEXT x:fa = fa+1
1060 IF ro = 16 THEN COLOR= 6-5*(fa > 270):PLOT 16,14:
PLOT 23,14
1070 NEXT ro:RETURN
2000 FOR de = 1 TO RND(1)*dr+dr:NEXT de:RETURN
3000 DATA 3,0,17,8,6,0,17,3,0,15,8,10,0,15,3,0,14
3010 DATA 8,12,0,14,3,0,13,8,14,0,13,5,0,12,8,4
3020 DATA 9,8,8,4,0,12,5,0,11,8,3,9,12,8,3,0,11
3030 DATA 9,0,11,8,2,9,2,8,3,9,4,8,3,9,2,8,2,0
3040 DATA 11,7,0,11,8,2,9,6,8,2,9,6,8,2,0,11,7
3050 DATA 0,11,8,2,9,6,8,2,9,6,8,2,0,11,7,0,11,8
3060 DATA 2,9,6,8,2,9,6,8,2,0,11,7,0,11,8,1,9,6
3070 DATA 8,4,9,6,8,1,0,11,5,0,11,8,1,9,16,8,1,0
3080 DATA 11,3,0,12,9,16,0,12,5,0,12,9,4,8,8,9
3090 DATA 4,0,12,7,0,12,9,5,8,1,15,4,8,1,9,5
3100 DATA 0,12,5,0,13,9,5,8,4,9,5,0,13,5,0,5
3110 DATA 14,8,9,14,14,8,0,5,5,0,3,14,11,9
3120 DATA 12,14,11,0,3,5,0,3,14,12,9,10,14,12
3130 DATA 0,3,5,0,3,14,13,9,8,14,13,0,3
4000 DATA 4,15,7,0,10,8,6,0,17,4,15,6,0,9,8,10,0,15
4010 DATA 4,15,5,0,9,8,12,0,14,4,15,4,0,9,8,14,0
4020 DATA 13,8,15,3,0,5,8,8,9,2,8,4,9,2,8,8,0,8
4030 DATA 16,15,2,0,6,8,1,5,1,8,4,9,2,8,1,9,2,8,2,9
4040 DATA 2,8,1,9,2,8,4,5,1,8,1,0,8,13,0,8,8,1,5,2
4050 DATA 8,2,9,4,8,1,9,4,8,1,9,4,8,2,5,2,8,1,0
4060 DATA 8,11,0,9,8,1,5,1,8,2,9,6,0,2,9,6,8,2,5
4070 DATA 1,8,1,0,9,7,0,9,8,4,9,6,0,2,9,6,8,4,0
4080 DATA 9,7,0,10,8,3,9,6,0,2,9,6,8,3,0,10,7,0
4090 DATA 11,8,2,9,5,0,4,9,5,8,2,0,11,5,0,11,8,4
4100 DATA 9,10,8,4,0,11,5,0,12,8,2,9,12,8,2,0,12
4110 DATA 7,0,12,8,2,9,2,8,8,9,2,8,2,0,12,13,0,4
4120 DATA 14,5,0,3,8,3,9,2,8,1,0,4,8,1,9,2,8,3,0
4130 DATA 2,14,5,0,5,9,0,3,14,10,8,3,9,2,8,4,9,2
4140 DATA 8,3,14,11,0,2,7,0,2,14,11,8,4,9,6,8,4
4150 DATA 14,12,0,1,4,0,1,14,13,8,12,14,14,4,0,1
4160 DATA 14,14,8,10,14,15,3,14,16,8,8,14,16
```

Apple II series/*Werewolf*

```
10 DIM R%(610)
20 FOR I = 1 TO 610:READ R%(I):NEXT I
30 HOME:GR:POKE -16302,0
40 FOR I = 40 TO 47:HLIN 0,39 AT I:NEXT I
50 FA = 1:GOSUB 1000:DR = 1000:GOSUB 2000
60 FOR X = 1 TO RND(1)*7+4
70 COLOR= 9:PLOT 16,14:PLOT 23,14
80 DR = 250:GOSUB 2000
90 COLOR= 6:PLOT 16,14:PLOT 23,14
100 DR = 1500:GOSUB 2000:NEXT X
110 COLOR= 15:FOR I = 0 TO 10 STEP 2:J = 6-I/2
120 HLIN 0,J AT I:HLIN 0,J AT I+1:NEXT I
130 DR = 750:GOSUB 2000
140 COLOR= 9:PLOT 16,14:PLOT 23,14
150 COLOR= 6:PLOT 15,14:PLOT 22,14
160 DR = 1000:GOSUB 2000
170 COLOR= 9:PLOT 15,14:PLOT 22,14
180 FOR DE = 1 TO 60:COLOR= INT(RND(1)*9)+1
190 IF DE = 60 THEN COLOR= 1
200 PLOT 16,14:PLOT 23,14:NEXT DE
210 FA = 270:GOSUB 1000
220 COLOR= 8:VLIN 4,7 AT 8:VLIN 6,7 AT 9
```

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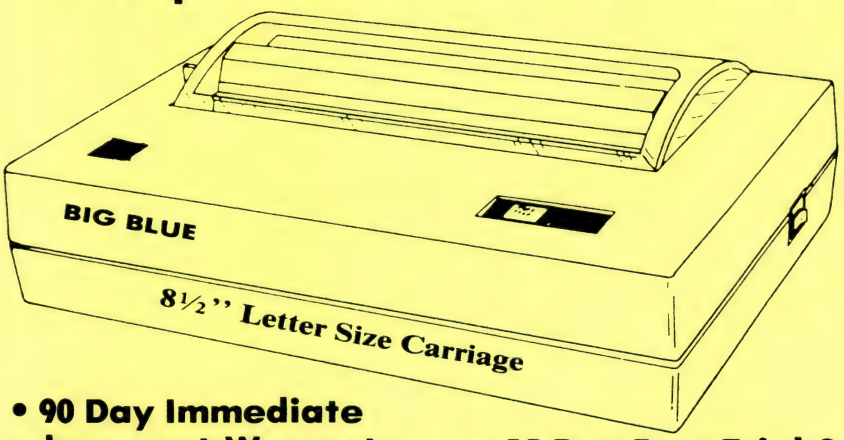

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CIRCLE READER SERVICE 39

```
230 VLIN 6,7 AT 30:VLIN 4,7 AT 31
240 COLOR= 15:PLOT 18,28:PLOT 18,29:PLOT 21,28
250 PLOT 21,29:TT = INT(RND(1)*400)+400
260 FOR DE = 1 TO TT:COLOR= INT(RND(1)*15)+1
270 IF DE = TT THEN COLOR= 1
280 PLOT 16,14:PLOT 23,14:NEXT DE:GOTO 50
1000 FOR RO = 0 TO 44 STEP 2
1010 Y = 0:FOR X = 1 TO R%(FA):COLOR= R%(FA+1)
1020 FA = FA+2:HLIN Y,Y+R%(FA)-1 AT RO
1030 HLIN Y,Y+R%(FA)-1 AT RO+1
1040 Y = Y+R%(FA):NEXT X:FA = FA+1
1050 IF RO = 16 THEN COLOR= 6-5*(FA > 270):PLOT 16,14:
PLOT 23,14
1060 NEXT RO:RETURN
2000 FOR DE = 1 TO RND(1)*DR+DR:NEXT DE:RETURN
3000 DATA 3,0,17,8,6,0,17,3,0,15,8,10,0,15,3,0,14
3010 DATA 8,12,0,14,3,0,13,8,14,0,13,5,0,12,8,4
3020 DATA 9,8,8,4,0,12,5,0,11,8,3,9,12,8,3,0,11
3030 DATA 9,0,11,8,2,9,2,8,3,9,4,8,3,9,2,8,2,0
3040 DATA 11,7,0,11,8,2,9,6,8,2,9,6,8,2,0,11,7
3050 DATA 0,11,8,2,9,6,8,2,9,6,8,2,0,11,7,0,11,8
3060 DATA 2,9,6,8,2,9,6,8,2,0,11,7,0,11,8,1,9,6
3070 DATA 8,4,9,6,8,1,0,11,5,0,11,8,1,9,16,8,1,0
3080 DATA 11,3,0,12,9,16,0,12,5,0,12,9,4,8,8,9
3090 DATA 4,0,12,7,0,12,9,5,8,1,15,4,8,1,9,5,0
3100 DATA 12,5,0,13,9,5,8,4,9,5,0,13,5,0,5,14,8
3110 DATA 9,14,14,8,0,5,5,0,3,14,11,9,12,14,11,0
3120 DATA 3,5,0,3,14,12,9,10,14,12,0,3,5,0,3,14
3130 DATA 13,9,8,14,13,0,3,5,0,3,14,14,9,6,14,14
3140 DATA 0,3,7,0,3,14,6,0,1,14,20,0,1,14,6,0,3
4000 DATA 7,0,3,14,6,0,1,14,20,0,1,14,6,0,3,4,15,7
4010 DATA 0,10,8,6,0,17,4,15,6,0,9,8,10,0,15,4,15
4020 DATA 5,0,9,8,12,0,14,4,15,4,0,9,8,14,0,13,8
4030 DATA 15,3,0,5,8,8,9,2,8,4,9,2,8,8,0,8,16,15
4040 DATA 2,0,6,8,1,5,1,8,4,9,2,8,1,9,2,8,2,9,2
4050 DATA 8,1,9,2,8,4,5,1,8,1,0,8,13,0,8,8,1,5,2
4060 DATA 8,2,9,4,8,1,9,4,8,1,9,4,8,2,5,2,8,1,0
4070 DATA 8,11,0,9,8,1,5,1,8,2,9,6,0,2,9,6,8,2,5
4080 DATA 1,8,1,0,9,7,0,9,8,4,9,6,0,2,9,6,8,4,0
4090 DATA 9,7,0,10,8,3,9,6,0,2,9,6,8,3,0,10,7,0
4100 DATA 11,8,2,9,5,0,4,9,5,8,2,0,11,5,0,11,8,4
4110 DATA 9,10,8,4,0,11,5,0,12,8,2,9,12,8,2,0,12
4120 DATA 7,0,12,8,2,9,2,8,8,9,2,8,2,0,12,13,0,4
4130 DATA 14,5,0,3,8,3,9,2,8,1,0,4,8,1,9,2,8,3,0
4140 DATA 2,14,5,0,5,9,0,3,14,10,8,3,9,2,8,4,9,2
4150 DATA 8,3,14,11,0,2,7,0,2,14,11,8,4,9,6,8,4
4160 DATA 14,12,0,1,4,0,1,14,13,8,12,14,14,4,0,1
4170 DATA 14,14,8,10,14,15,3,14,16,8,8,14,16,3,14
4180 DATA 17,8,6,14,17,7,14,9,0,1,14,8,8,4,14,8,0
4190 DATA 1,14,9,7,14,9,0,1,14,9,8,2,14,9,0,1,14,9
```

Atari 400/800, 600/800XL, & 130XE/*Werewolf*

```
10 DIM R(610):PRINT CHR$(125);"STAND BY ...";
20 FOR I=1 TO 610:READ R:R(I)=R:NEXT I
30 POKE 77,0:GRAPHICS 3+16
40 SETCOLOR 1,1,15:SETCOLOR 2,3,3
50 FA=1:GOSUB 1000
60 DR=1000:GOSUB 2000
70 FOR X=1 TO RND(1)*7+4
80 COLOR 1:PLOT 16,7:PLOT 23,7
90 DR=100:GOSUB 2000
100 COLOR 0:PLOT 16,7:PLOT 23,7
110 DR=1000:GOSUB 2000:NEXT X
120 COLOR 2
130 FOR I=0 TO 5:J=6-I
140 PLOT 0,I:DRAWTO J,I:NEXT I
150 DR=450:GOSUB 2000
160 COLOR 1:PLOT 16,7:PLOT 23,7
170 COLOR 0:PLOT 15,7:PLOT 22,7
180 DR=400:GOSUB 2000
190 COLOR 1:PLOT 15,7:PLOT 22,7
200 FOR DE=1 TO 60:COLOR INT(RND(1)*4)
210 IF DE=60 THEN COLOR 0
220 PLOT 16,7:PLOT 23,7:NEXT DE
230 FA=270:GOSUB 1000:COLOR 3
240 PLOT 8,3:PLOT 9,3:PLOT 8,2
250 PLOT 31,3:PLOT 30,3:PLOT 31,2
260 COLOR 2:PLOT 18,14:PLOT 21,14
270 TT=INT(RND(1)*400)+400
280 FOR DE=1 TO TT:COLOR INT(RND(1)*4)
290 IF DE=TT THEN COLOR 0
300 PLOT 16,7:PLOT 23,7
310 NEXT DE:GOTO 50
1000 FOR RO=0 TO 22
1010 Y=0:FOR X=1 TO R(FA)
1020 COLOR R(FA+1):FA=FA+2
1030 PLOT Y,RO:DRAWTO Y+R(FA)-1,RO
1040 Y=Y+R(FA):NEXT X:FA=FA+1
1050 IF RO=7 THEN COLOR 0:PLOT 16,7:PLOT 23,7
1060 NEXT RO:RETURN
2000 FOR DE=1 TO RND(1)*DR+DR:NEXT DE:RETURN
3000 DATA 3,0,17,3,6,0,17,3,0,15,3,10,0,15,3,0,14
3010 DATA 3,12,0,14,3,0,13,3,14,0,13,5,0,12,3,4
3020 DATA 9,8,3,4,0,12,5,0,11,3,3,9,12,3,3,0,11
3030 DATA 9,0,11,3,2,9,2,3,3,9,4,3,3,9,2,3,2,0
3040 DATA 11,7,0,11,3,2,9,6,3,2,9,6,3,2,0,11,7
3050 DATA 0,11,3,2,9,6,3,2,9,6,3,2,0,11,7,0,11,3
3060 DATA 2,9,6,3,2,9,6,3,2,0,11,7,0,11,3,1,9,6
3070 DATA 3,4,9,6,3,1,0,11,5,0,11,3,1,9,16,3,1,0
3080 DATA 11,3,0,12,9,16,0,12,5,0,12,9,4,3,8,9
3090 DATA 4,0,12,7,0,12,9,5,3,1,2,4,3,1,9,5,0
3100 DATA 12,5,0,13,9,5,3,4,9,5,0,13,5,0,5,14,8
3110 DATA 9,14,14,8,0,5,5,0,3,14,11,9,12,14,11,0
3120 DATA 3,5,0,3,14,12,9,10,14,12,0,3,5,0,3,14
3130 DATA 13,9,8,14,13,0,3,5,0,3,14,14,9,6,14,14
3140 DATA 0,3,7,0,3,14,6,0,1,14,20,0,1,14,6,0,3
4000 DATA 7,0,3,14,6,0,1,14,20,0,1,14,6,0,3,4,2,7
4010 DATA 0,10,3,6,0,17,4,2,6,0,9,3,10,0,15,4,2
4020 DATA 5,0,9,3,12,0,14,4,2,4,0,9,3,14,0,13,8
4030 DATA 2,3,0,5,3,8,9,2,3,4,9,2,3,8,0,8,16,2
4040 DATA 2,0,6,3,1,5,1,3,4,9,2,3,1,9,2,3,2,9,2
4050 DATA 3,1,9,2,3,4,5,1,3,1,0,8,13,0,8,3,1,5,2
4060 DATA 3,2,9,4,3,1,9,4,3,1,9,4,3,2,5,2,3,1,0
4070 DATA 8,11,0,9,3,1,5,1,3,2,9,6,0,2,9,6,3,2,5
4080 DATA 1,3,1,0,9,7,0,9,3,4,9,6,0,2,9,6,3,4,0
4090 DATA 9,7,0,10,3,3,9,6,0,2,9,6,3,3,0,10,7,0
4100 DATA 11,3,2,9,5,0,4,9,5,3,2,0,11,5,0,11,3,4
4110 DATA 9,10,3,4,0,11,5,0,12,3,2,9,12,3,2,0,12
4120 DATA 7,0,12,3,2,9,2,3,8,9,2,3,2,0,12,13,0,4
4130 DATA 14,5,0,3,3,3,9,2,3,1,0,4,3,1,9,2,3,3,0
4140 DATA 2,14,5,0,5,9,0,3,14,10,3,3,9,2,3,4,9,2
4150 DATA 3,3,14,11,0,2,7,0,2,14,11,3,4,9,6,3,4
4160 DATA 14,12,0,1,4,0,1,14,13,3,12,14,14,4,0,1
4170 DATA 14,14,3,10,14,15,3,14,16,3,8,14,16,3,14
4180 DATA 17,3,6,14,17,7,14,9,0,1,14,8,3,4,14,8,0
4190 DATA 1,14,9,7,14,9,0,1,14,9,3,2,14,9,0,1,14,9
```

Commodore 64 & 128 (40-column)/*Werewolf*

```
10 DIM EY(6,2),R$(2,24)
20 SQ$=CHR$(18)+CHR$(32):ES=1359
30 POKE 53281,0:POKE 53280,0:PRINT CHR$(147)
40 PRINT CHR$(5);TAB(14);"STAND BY ..."
50 FOR X=1 TO 6:FOR Y=1 TO 2
60 READ EY(X,Y):NEXT Y,X
70 FOR X=1 TO 2:FOR Y=1 TO 23
80 READ PR:R$(X,Y)=""
90 FOR Z=1 TO PR:READ KO,T
100 R$(X,Y)=R$(X,Y)+CHR$(KO+144)
110 FOR LN=1 TO T:R$(X,Y)=R$(X,Y)+SQ$
120 NEXT LN,Z,Y,X
130 FA=1:GOSUB 1000
140 DR=1000:GOSUB 2000
150 FOR X=1 TO RND(1)*9+4
160 POKE ES+1,195:POKE ES+8,195
170 FOR DE=1 TO RND(1)*250+25:NEXT DE
180 POKE ES+1,215:POKE ES+8,215
190 GOSUB 2000:NEXT X
200 FOR I=0 TO 5:FOR J=1 TO 7-I+(I=0)
210 POKE 1024+I+40*J,160:POKE 55296+I+40*J,15
220 NEXT J,I
230 DR=500:GOSUB 2000
```

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CIRCLE READER SERVICE 10

HALLOWEEN PROGRAM

```
240 POKE ES,209:POKE ES+1,160
250 POKE ES+7,209:POKE ES+8,160:GOSUB 2000
260 POKE ES,188:POKE ES+1,215
270 POKE ES+7,188:POKE ES+8,215
280 FOR X=1 TO 20:POKE 55632,INT(RND(1)*7)+2
290 POKE 55639,INT(RND(1)*7)+2:NEXT X
300 FA=2:GOSUB 1000
310 POKE 1642,105:POKE 1645,95:POKE 55914,1
320 POKE 55917,1:FOR DE=1 TO RND(1)*200+200
330 POKE 55632,INT(RND(1)*7)+2
340 POKE 55639,INT(RND(1)*7)+2:NEXT DE:GOTO 130
1000 PRINT CHR$(19):FOR X=1 TO 23
1010 PRINT R$(FA,X);
1020 IF X=8 THEN FOR Y=1 TO 6:POKE ES+EY(Y,2),EY(Y,1):
NEXT Y
1030 NEXT X:RETURN
2000 FOR DE=1 TO RND(1)*DR+DR:NEXT DE:RETURN
3000 DATA 188,0,215,1,190,2,188,7,215,8,190,9,3,0,17
3010 DATA 5,6,0,17,3,0,15,5,10,0,15,3,0,14,5,12,0,14
3020 DATA 3,0,13,5,14,0,13,5,0,12,5,4,6,8,5,4,0,12,5
3030 DATA 0,11,5,3,6,12,5,3,0,11,9,0,11,5,2,6,2,5,3,6
3040 DATA 4,5,3,6,2,5,2,0,11,7,0,11,5,2,6,6,-15,2,6,6
3050 DATA 5,2,0,11,7,0,11,5,2,6,6,-15,2,6,6,5,2,0,11
3060 DATA 7,0,11,5,2,6,6,-15,2,6,6,5,2,0,11,7,0,11,5
3070 DATA 1,6,6,-15,4,6,6,5,1,0,11,5,0,11,5,1,6,16,5
3080 DATA 1,0,11,3,0,12,6,16,0,12,5,0,12,6,4,-116,8,6
3090 DATA 4,0,12,7,0,12,6,5,-116,1,-139,4,-116,1,6,5
3100 DATA 0,12,5,0,13,6,5,-116,4,6,5,0,13,5,0,5,10,8
3110 DATA 6,14,10,8,0,5,5,0,3,10,11,6,12,10,11,0,3,5
3120 DATA 0,3,10,12,6,10,10,12,0,3,5,0,3,10,13,6,8,10
3130 DATA 13,0,3,5,0,3,10,14,6,6,10,14,0,3,7,0,3,10,6
3140 DATA 0,1,10,20,0,1,10,6,0,3,7,0,3,10,6,0,1,10,20
3150 DATA 0,1,10,6,0,3
4000 DATA 4,11,6,0,11,5,6,0,17,4,11,6,0,9,5,10,0,15,8
4010 DATA 11,5,0,3,5,1,0,5,5,12,0,5,5,1,0,8,8,11,4,0
4020 DATA 4,5,2,0,3,5,14,0,3,5,2,0,8,8,11,3,0,5,5,8,6
4030 DATA 2,5,4,6,2,5,8,0,8,16,11,2,0,6,5,1,7,1,5,4,6
4040 DATA 2,5,1,6,2,5,2,6,2,5,1,6,2,5,4,7,1,5,1,0,8,13
4050 DATA 0,8,5,1,7,2,5,2,6,4,5,1,6,4,5,1,6,4,5,2,7,2
4060 DATA 5,1,0,8,11,0,9,5,1,7,1,5,2,6,6,0,2,6,6,5,2
4070 DATA 7,1,5,1,0,9,7,0,9,5,4,6,6,0,2,6,6,5,4,0,9,7
4080 DATA 0,10,5,3,6,6,0,2,6,6,5,3,0,10,7,0,11,5,2,6
4090 DATA 5,0,4,6,5,5,2,0,11,5,0,11,5,4,6,10,5,4,0,11
4100 DATA 5,0,12,5,2,6,12,5,2,0,12,7,0,12,5,2,6,2,5,8
4110 DATA 6,2,5,2,0,12,13,0,4,10,5,0,3,5,3,6,2,5,1,0
4120 DATA 4,5,1,6,2,5,3,0,2,10,5,0,5,9,0,3,10,10,5,3
4130 DATA 6,2,5,4,6,2,5,3,10,11,0,2,7,0,2,10,11,5,4,6
4140 DATA 6,5,4,10,12,0,1,4,0,1,10,13,5,12,10,14,4,0
4150 DATA 1,10,14,5,10,10,15,3,10,16,5,8,10,16,3,10,17
4160 DATA 5,6,10,17,7,10,9,0,1,10,8,5,4,10,8,0,1,10,9
4170 DATA 7,10,9,0,1,10,9,5,2,10,9,0,1,10,9
```

IBM PC & compatibles/*Werewolf*

This program has been tested and found to work on the following computers and hardware configurations, using the BASICs shown: IBM PC w/Color/Graphics Monitor Adapter, w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr w/Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 01.01.00. It should also work on many other PC compatibles.

```
10 DIM R%(610):EY$="0":SQ$=CHR$(219)
20 CLS:WIDTH 40:LOCATE ,,0:KEY OFF
30 COLOR 7,0:PRINT TAB(14);"STAND BY ..."
40 FOR I=1 TO 610:READ R%(I):NEXT I:CLS
50 FA=1:GOSUB 1000:DR=1000:GOSUB 2000
60 FOR X=1 TO RND*7+4
70 COLOR 12:LOCATE 8,17:PRINT SQ$
80 LOCATE 8,24:PRINT SQ$:DR=250:GOSUB 2000
90 COLOR 9:LOCATE 8,17:PRINT EY$
100 LOCATE 8,24:PRINT EY$:DR=1500:GOSUB 2000:NEXT X
110 COLOR 15:FOR Y=1 TO 6
120 LOCATE Y,1:PRINT STRING$(8-Y+(Y=1),SQ$):NEXT Y
130 DR=750:GOSUB 2000
140 COLOR 12:LOCATE 8,17:PRINT SQ$
150 LOCATE 8,24:PRINT SQ$
160 COLOR 9:LOCATE 8,16:PRINT "("
170 LOCATE 8,23:PRINT "(":DR=600:GOSUB 2000
180 COLOR 12:LOCATE 8,16:PRINT SQ$
190 LOCATE 8,23:PRINT SQ$
200 FOR DE=1 TO 40:COLOR INT(RND*4)+1
210 IF DE=40 THEN COLOR 4
220 LOCATE 8,17:PRINT EY$:LOCATE 8,24:PRINT EY$
230 NEXT DE:FA=270:GOSUB 1000
240 COLOR 15:LOCATE 15,19:PRINT "V"
250 LOCATE 15,22:PRINT "V"
260 COLOR 6:LOCATE 4,9:PRINT SQ$;SQ$
270 LOCATE 4,31:PRINT SQ$;SQ$
280 LOCATE 3,9:PRINT SQ$:LOCATE 3,32:PRINT SQ$
290 TT=INT(RND*200)+200
300 FOR DE=1 TO TT:COLOR INT (RND*15)+1
310 IF DE=TT THEN COLOR 12
320 LOCATE 8,17:PRINT EY$:LOCATE 8,24:PRINT EY$
330 NEXT DE:GOTO 50
1000 FOR RO=1 TO 23:CO=1
1010 FOR X=1 TO R%(FA):COLOR R%(FA+1):FA=FA+2
1020 LOCATE RO,CO:PRINT STRING$(R%(FA),219);
1030 CO=CO+R%(FA):NEXT X:FA=FA+1
1040 IF RO<>8 THEN 1070
1050 COLOR 9+5*(FA>270):LOCATE 8,17:PRINT EY$
1060 LOCATE 8,24:PRINT EY$
1070 NEXT RO:RETURN
2000 FOR DE=1 TO RND*DR+DR:NEXT DE:RETURN
3000 DATA 3,0,17,6,6,0,17,3,0,15,6,10,0,15,3,0,14,6
3010 DATA 12,0,14,3,0,13,6,14,0,13,5,0,12,6,4,12,8
3020 DATA 6,4,0,12,5,0,11,6,3,12,12,6,3,0,11,9,0
3030 DATA 11,6,2,12,2,6,3,12,4,6,3,12,2,6,2,0,11,7
3040 DATA 0,11,6,2,12,6,6,2,12,6,6,2,0,11,7,0,11,6
3050 DATA 2,12,6,6,2,12,6,6,2,0,11,7,0,11,6,2,12,6
3060 DATA 6,2,12,6,6,2,0,11,7,0,11,6,1,12,6,6,4,12
3070 DATA 6,6,1,0,11,5,0,11,6,1,12,16,6,1,0,11,3,0
3080 DATA 12,12,16,0,12,5,0,12,12,4,6,8,12,4,0,12
3090 DATA 7,0,12,12,5,6,1,15,4,6,1,12,5,0,12,5,0
3100 DATA 13,12,5,6,4,12,5,0,13,5,0,5,10,8,12,14
3110 DATA 10,8,0,5,5,0,3,10,11,12,12,10,11,0,3,5
3120 DATA 0,3,10,12,12,10,10,12,0,3,5,0,3,10,13
3130 DATA 12,8,10,13,0,3,5,0,3,10,14,12,6,10,14
3140 DATA 0,3,7,0,3,10,6,0,1,10,20,0,1,10,6,0,3
3150 DATA 7,0,3,10,6,0,1,10,20,0,1,10,6,0,3,4
3160 DATA 15,6,0,11,6,6,0,17,4,15,6,0,9,6,10,0
3170 DATA 15,4,15,5,0,9,6,12,0,9,4,15,4,0,9,6,14
3180 DATA 0,13,8,15,3,0,5,6,8,12,2,6,4,12,2,6,8,0
3190 DATA 8,16,15,2,0,6,6,1,7,1,6,4,12,2,6,1,12,2
3200 DATA 6,2,12,2,6,1,12,2,6,4,7,1,6,1,0,8,13,0,8,6
3210 DATA 1,7,2,6,2,12,4,6,1,12,4,6,1,12,4,6,2,7,2
3220 DATA 6,1,0,8,11,0,9,6,1,7,1,6,2,12,6,0,2,12,6
3230 DATA 6,2,7,1,6,1,0,9,7,0,9,6,4,12,6,0,2,12,6
3240 DATA 6,4,0,9,7,0,10,6,3,12,6,0,2,12,6,6,3,0,10
3250 DATA 7,0,11,6,2,12,5,0,4,12,5,6,2,0,11,5,0,11
3260 DATA 6,4,12,10,6,4,0,11,5,0,12,6,2,12,12,6,2,0
3270 DATA 12,7,0,12,6,2,12,2,6,8,12,2,6,2,0,12,13,0
3280 DATA 4,10,5,0,3,6,3,12,2,6,1,0,4,6,1,12,2,6,3
3290 DATA 0,2,10,5,0,5,9,0,3,10,10,6,3,12,2,6,4,12
3300 DATA 2,6,3,10,11,0,2,7,0,2,10,11,6,4,12,6,6,4
3310 DATA 10,12,0,1,4,0,1,10,13,6,12,10,14,4,0,1,10
3320 DATA 14,6,10,10,15,3,10,16,6,8,10,16,3,10,17,6
3330 DATA 6,10,17,7,10,9,0,1,10,8,6,4,10,8,0,1,10,9
3340 DATA 7,10,9,0,1,10,9,6,2,10,9,0,1,10,9
```

Macintosh w/Microsoft BASIC 2.0 or 2.1/*Werewolf*

```
DIM A%(59),R%(776),EY$(5)
CALL TEXTFONT(1):CALL TEXTSIZE(9)
CALL TEXTFACE(33):CALL TEXTMODE(0)
WINDOW 1,"WILL THE WEREWOLF",(0,38)-(527,338)
CLS:PRINT:PRINT TAB(40);"STAND BY ..."
FOR I=1 TO 776:READ R%(I):NEXT I
EY$(0)="":EY$(1)="<0>":EY$(2)="<->":EY$(3)="0 >"
EY$(4)="<*>":EY$(5)="<+>":RANDOMIZE TIMER
FOR I=0 TO 11 STEP 2:FOR J=0 TO 11
PSET (J,I):PSET (24+J,I):PSET (24+J,I+1)
PSET (12+J,I+INT(RND*7)):PSET (12+J,INT(RND*7))
NEXT J,I
FOR I=0 TO 11 STEP 2:FOR J=0 TO 11 STEP 2
PSET (36+J,I):NEXT J,I:C=0
FOR I=0 TO 59 STEP 12:GET (I,0)-(I+11,9),A%(C*12)
C=C+1:NEXT I:CLS:LINE (0,0)-(527,338),,BF
```

→

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CIRCLE READER SERVICE 26

```
DRAW.MAN.FACE:
  FA=1:GOSUB DRAW.FACE.ROUTINE
  DR=1000:GOSUB DELAY.ROUTINE
  FOR X=1 TO RND*7+4:NC=2:GOSUB DRAW.EYES
  DR=500:GOSUB DELAY.ROUTINE:NC=1:GOSUB DRAW.EYES
  DR=2000:GOSUB DELAY.ROUTINE:NEXT X
  FOR I=0 TO 59 STEP 12
  FOR J=0 TO (6-I/10+(I=0))*10 STEP 10
  PUT (I,J),A%(24):NEXT J,I
  DR=1000:GOSUB DELAY.ROUTINE:NC=3:GOSUB DRAW.EYES
  DR=4000:GOSUB DELAY.ROUTINE:EB=40:GOSUB BLINK
DRAW.WOLF.FACE:
  FA=335:GOSUB DRAW.FACE.ROUTINE
  X=0:Y=10:FOR DE=180 TO 190 STEP 2
  LINE (220+X,DE)-(220+Y,DE),30,B
  LINE (250+X,DE)-(250+Y,DE),30,B
  X=X+1:Y=Y-1:NEXT DE
  EB=RND*200+200:GOSUB BLINK
  GOTO DRAW.MAN.FACE
DRAW.FACE.ROUTINE:
  FOR RO=0 TO 290 STEP 10
  Y=0:FOR X=1 TO R%(FA):KO=12*R%(FA+1):FA=FA+2
  FOR CO=Y*12 TO (Y+R%(FA)-1)*12 STEP 12
  PUT (CO,RO),A%(KO),PRESET:NEXT CO
  Y=Y+R%(FA):NEXT X:FA=FA+1
  IF RO=110 THEN NC=1:GOSUB DRAW.EYES
  NEXT RO:RETURN
DELAY.ROUTINE:
  FOR DE=1 TO RND*DR+DR:NEXT DE:RETURN
DRAW.EYES:
  LOCATE 9,30:PRINT EY$(NC);
  LOCATE 9,48:PRINT EY$(NC);:RETURN
BLINK:
  FOR DE=1 TO EB:NC=INT(RND*2)+4:GOSUB DRAW.EYES
  NC=1:GOSUB DRAW.EYES:NEXT DE:RETURN
  DATA 3,4,17,1,6,4,18,3,4,16,1,8,4,17,3,4,14,1,12
  DATA 4,15,3,4,13,1,14,4,14,3,4,12,1,16,4,12,5,4,11
  DATA 1,4,2,10,1,4,4,12,5,4,10,1,3,2,14,1,3,4,11,5
  DATA 4,9,1,3,2,16,1,3,4,10,11,4,9,1,2,2,3,1,3,2,2
  DATA 3,2,2,2,1,3,2,3,1,2,4,10,7,4,9,1,2,2,8,3,2,2
  DATA 8,1,2,4,10,7,4,9,1,2,2,8,3,2,2,8,1,2,4,10,7
  DATA 4,9,1,2,2,8,3,2,2,8,1,2,4,10,7,4,9,1,1,2,8,3
  DATA 4,2,8,1,1,4,10,7,4,9,1,1,2,8,3,4,2,8,1,1,4,10
  DATA 3,4,10,2,20,4,11,3,4,10,2,20,4,11,3,4,10,2,20
  DATA 4,11,5,4,10,2,5,3,10,2,5,4,11,7,4,10,2,6,3,1
  DATA 2,6,3,1,2,6,4,11,7,4,11,2,6,3,1,2,4,3,1,2,6
  DATA 4,12,5,4,11,2,7,3,4,2,7,4,12,5,4,5,0,7,2,16
  DATA 0,7,4,6,5,4,4,0,9,2,14,0,9,4,5,5,4,4,0,10,2
  DATA 12,0,10,4,5,5,4,3,0,12,2,10,0,12,4,4,5,4,3,0
  DATA 13,2,8,0,13,4,4,5,4,3,0,14,2,6,0,14,4,4,3,4
  DATA 3,0,34,4,4,3,4,3,0,34,4,4,7,4,3,0,5,4,1,0,22
  DATA 4,1,0,5,4,4,4,2,5,4,12,1,6,4,18,4,2,5,4,11,1
  DATA 8,4,17,4,2,4,4,11,1,10,4,15,4,2,3,4,10,1,14
  DATA 4,14,8,2,2,4,5,1,1,4,4,1,16,4,4,1,1,4,8,12,2
  DATA 1,4,6,1,2,4,2,1,4,2,3,1,4,2,3,1,4,4,2,1,2,4
  DATA 8,7,4,7,1,6,2,6,1,2,2,6,1,6,4,8,13,4,7,1,1,3
  DATA 1,1,3,2,3,1,1,2,8,1,1,2,3,1,3,3,1,1,1,4,8,15
  DATA 4,7,1,1,3,2,1,1,2,5,1,1,2,2,4,2,2,2,1,1,2,5
  DATA 1,1,3,2,1,1,4,8,11,4,7,1,2,3,1,1,1,2,8,4,2,2
  DATA 8,1,1,3,1,1,2,4,8,7,4,7,1,4,2,8,4,2,2,8,1,4
  DATA 4,8,7,4,8,1,3,2,8,4,2,2,8,1,3,4,9,7,4,9,1,2
  DATA 2,7,4,4,2,7,1,2,4,10,7,4,9,1,3,2,6,4,4,2,6,1
  DATA 3,4,10,5,4,10,1,3,2,14,1,3,4,11,5,4,10,1,2,2
  DATA 16,1,2,4,11,5,4,10,1,2,2,16,1,2,4,11,7,4,10
  DATA 1,3,2,2,3,10,2,2,1,3,4,11,9,4,10,1,4,2,2,3,1
  DATA 4,6,3,1,2,2,1,4,4,11,13,4,4,0,3,4,4,1,4,2,2
  DATA 3,1,4,4,3,1,2,2,1,4,4,4,0,3,4,5,11,4,3,0,6,4
  DATA 2,1,5,2,2,3,4,2,2,1,5,4,2,0,7,4,3,7,4,3,0,9
  DATA 1,4,2,8,1,4,0,11,4,3,7,4,2,0,11,1,4,2,6,1,4
  DATA 0,12,4,2,5,4,2,0,12,1,12,0,13,4,2,5,4,1,0,14
  DATA 1,10,0,15,4,1,3,0,16,1,8,0,16,3,0,17,1,6,0,17
  DATA 3,0,18,1,4,0,18,3,0,19,1,2,0,19,5,0,8,4,1,0
  DATA 22,4,1,0,8
```

Tandy Color Computer/*Werewolf*

```
10 CLEAR 2000:DIM R$(2,15)
20 CLS:PRINT TAB(10);"STAND BY ..."
30 EY$="<O>":EC$="<->":EL$="O >"
40 FOR X=1 TO 2:FOR Y=0 TO 15
50 READ PR:R$(X,Y)=""
60 FOR Z=1 TO PR:READ KO,T
70 FOR LN=1 TO T:R$(X,Y)=R$(X,Y)+CHR$(KO)
80 NEXT LN,Z,Y,X:CLS(0)
90 FA=1:GOSUB 1000
100 DR=1000:GOSUB 2000
110 FOR X=1 TO RND(7)+4
120 PRINT@140,EC$;:PRINT@145,EC$;
130 DR=250:GOSUB 2000
140 PRINT@140,EY$;:PRINT@145,EY$;
150 DR=1500:GOSUB 2000:NEXT X
160 FOR X=0 TO 4:FOR Y=0 TO 4-X+(X=0)
170 PRINT@X+32*Y,CHR$(207);:NEXT Y,X
180 DR=750:GOSUB 2000
190 PRINT@140,EL$;:PRINT@145,EL$;
200 DR=1000:GOSUB 2000
210 PRINT@140,EY$;:PRINT@145,EY$;
220 EB=40:GOSUB 3000
230 FA=2:GOSUB 1000
240 EB=RND(300)+300:GOSUB 3000:GOTO 90
1000 FOR Y=0 TO 15
1010 PRINT@Y*32,R$(FA,Y);
1020 IF Y=4 THEN PRINT@140,EY$;:PRINT@145,EY$;
1030 DR=100:GOSUB 2000
1040 NEXT Y:RETURN
2000 FOR DE=1 TO DR:NEXT DE:RETURN
3000 FOR DE=1 TO EB:KO=RND(7)*16
3010 IF DE=EB THEN KO=48
3020 PRINT@141,CHR$(143+KO);
3030 PRINT@146,CHR$(143+KO);
3040 PRINT@141,"O";:PRINT@146,"O";
3050 NEXT DE:RETURN
4000 DATA 3,128,11,191,10,128,10,3,128,10,191,12
4010 DATA 128,9,5,128,9,191,2,255,10,191,2,128,8
4020 DATA 9,128,8,191,2,255,2,191,3,255,2,191,3
4030 DATA 255,2,191,2,128,7,7,128,7,191,2,255,6
4040 DATA 191,2,255,6,191,2,128,6,7,128,7,191,2
4050 DATA 255,6,191,2,255,6,191,2,128,6,7,128,7
4060 DATA 191,1,255,6,191,4,255,6,191,1,128,6,3
4070 DATA 128,8,255,16,128,7,5,128,9,255,3,191,8
4080 DATA 255,3,128,8,7,128,10,255,3,191,1,207,4
4090 DATA 191,1,255,3,128,9,7,128,5,175,6,255,3
4100 DATA 191,4,255,3,175,6,128,4,5,128,4,175,8
4110 DATA 255,8,175,8,128,3,5,128,3,175,10,255,6
4120 DATA 175,10,128,2,3,128,2,175,28,128,1,3,128
4130 DATA 2,175,28,128,1,7,128,2,175,5,128,1,175
4140 DATA 16,128,1,175,5,128,1
5000 DATA 4,207,5,128,6,191,10,128,10,8,207,4,128
5010 DATA 2,191,1,128,3,191,12,128,3,191,1,128,5
5020 DATA 12,207,3,128,3,191,6,255,1,191,1,255,1
5030 DATA 191,2,255,1,191,1,255,2,191,5,128,5,10
5040 DATA 207,2,128,4,191,5,255,3,191,1,255,2,191
5050 DATA 1,255,4,191,4,128,5,7,128,7,191,3,255,5
5060 DATA 128,2,255,5,191,3,128,6,7,128,8,191,3
5070 DATA 255,4,128,2,255,4,191,3,128,7,7,128,8
5080 DATA 191,2,255,4,128,4,255,4,191,2,128,7,5
5090 DATA 128,8,191,2,255,12,191,2,128,7,7,128,9
5100 DATA 191,2,255,1,191,8,255,1,191,2,128,8
5110 DATA 13,128,3,175,7,191,2,255,1,191,1,207,1
5120 DATA 128,2,207,1,191,1,255,1,191,2,175,6,128
5130 DATA 3,9,128,2,175,9,191,2,255,1,191,4,255,1
5140 DATA 191,2,175,8,128,2,7,128,1,175,11,191,2
5150 DATA 255,4,191,2,175,10,128,1,4,128,1,175
5160 DATA 12,191,6,175,12,3,175,14,191,4,175,13
5170 DATA 3,175,15,191,2,175,14,5,175,7,128,1,175
5180 DATA 16,128,1,175,6
```

Tandy Models III & 4 (Model III mode)/*Werewolf*

```
10 CLEAR 3000:DIM R$(2,15)
20 CLS:PRINT TAB(26);"STAND BY ..."
30 EY$="<O>":EC$="<->":EL$="O >"
```

→

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CIRCLE READER SERVICE 46

```
40 FOR X=1 TO 2:FOR Y=0 TO 15
50 READ PR:R$(X,Y)=""
60 FOR Z=1 TO PR:READ KO,T
70 FOR LN=1 TO T:R$(X,Y)=R$(X,Y)+CHR$(KO)
80 NEXT LN,Z,Y,X:CLS
90 FA=1:GOSUB 1000
100 DR=1000:GOSUB 2000
110 FOR X=1 TO RND(7)+4
120 PRINT@280,EC$;@292,EC$;
130 DR=250:GOSUB 2000
140 PRINT@280,EY$;@292,EY$;
150 DR=1500:GOSUB 2000:NEXT X
160 FOR Y=0 TO 3
170 PRINT@Y*64,STRING$(5-Y,191);:NEXT Y
180 DR=750:GOSUB 2000
190 PRINT@280,EL$;@292,EL$;
200 DR=1000:GOSUB 2000
210 PRINT@280,EY$;@292,EY$;
220 EB=40:GOSUB 3000
230 FA=2:GOSUB 1000
240 EB=RND(300)+300:GOSUB 3000:GOTO 90
1000 FOR Y=0 TO 15:PRINT@Y*64,R$(FA,Y);
1010 IF Y=4 THEN PRINT@280,EY$;@292,EY$;
1020 DR=100:GOSUB 2000
1030 NEXT Y:RETURN
2000 FOR DE=1 TO DR:NEXT DE:RETURN
3000 FOR TM=1 TO EB:CH$=CHR$(RND(2)+41)
3010 PRINT@281,CH$;@293,CH$;:NEXT TM
3020 PRINT@281,CHR$(42);@293,CHR$(42);:RETURN
4000 DATA 3,128,23,176,17,128,23,5,128,21,188,1,191
4010 DATA 19,188,1,128,21,7,128,20,191,2,131,1,128,17
4020 DATA 131,1,191,2,128,20,11,128,18,191,3,128,2,140
4030 DATA 5,128,2,176,3,128,2,140,5,128,2,191,3,128
4040 DATA 18,7,128,17,191,3,128,10,191,3,128,10,191
4050 DATA 3,128,17,7,128,17,191,3,128,9,191,5,128,9
4060 DATA 191,3,128,17,5,128,18,191,1,128,25,191,1,128
4070 DATA 18,7,128,19,191,1,128,5,188,13,128,5,191,1
4080 DATA 128,19,9,128,20,191,1,128,5,191,2,128,7,191
4090 DATA 2,128,5,191,1,128,20,7,128,21,191,1,128,6
4100 DATA 191,7,128,6,191,1,128,21,5,128,10,191,14,128
4110 DATA 15,191,14,128,10,11,128,9,191,1,128,14,131
4120 DATA 1,191,1,128,11,191,1,131,1,128,14,191,1,128
4130 DATA 9,9,128,8,191,1,128,17,131,1,191,9,131,1,128
4140 DATA 17,191,1,128,8,5,128,7,191,1,128,47,191,1
4150 DATA 128,7,9,128,7,191,1,128,10,191,1,128,25,191
4160 DATA 1,128,10,191,1,128,7,9,128,7,191,1,128,10
4170 DATA 191,1,128,25,191,1,128,10,191,1,128,7
5000 DATA 10,191,5,128,10,188,1,176,1,128,6,176,17,128
5010 DATA 6,176,1,188,1,128,15,12,191,4,128,11,191,4
5020 DATA 188,1,176,1,188,1,191,19,188,1,176,1,188,1
5030 DATA 191,4,128,15,22,191,3,128,13,191,1,128,1,191
5040 DATA 4,131,1,128,1,176,1,128,4,131,1,143,1,191
5050 DATA 1,143,1,131,1,128,4,176,1,128,1,131,1,191
5060 DATA 4,128,1,191,1,128,16,16,191,2,128,14,191,5
5070 DATA 128,4,131,1,140,1,176,1,128,2,176,3,128,2
5080 DATA 176,1,140,1,131,1,128,4,191,5,128,16,7,128
5090 DATA 17,191,4,128,9,191,3,128,9,191,4,128,17,11
5100 DATA 128,17,191,4,189,1,176,1,128,6,191,5,128,6
5110 DATA 176,1,190,1,191,4,128,17,7,128,18,191,3,135
5120 DATA 1,128,19,139,1,191,3,128,18,9,128,19,191,2
5130 DATA 189,1,128,3,188,13,128,3,190,1,191,2,128,19
5140 DATA 15,128,20,191,3,188,1,128,2,191,2,128,1,86
5150 DATA 1,128,3,86,1,128,1,191,2,128,2,188,1,191,3
5160 DATA 128,20,15,128,7,176,2,188,7,176,5,191,4,188
5170 DATA 1,128,2,191,7,128,2,188,1,191,4,176,3,188
5180 DATA 12,176,2,128,4,15,128,6,191,1,128,15,131,1
5190 DATA 143,1,191,3,176,1,128,7,176,1,191,3,143,1
5200 DATA 131,1,128,18,191,1,128,3,17,128,5,191,1,128
5210 DATA 19,131,1,143,1,191,2,188,1,176,1,128,1,176
5220 DATA 1,188,1,191,2,143,1,131,1,128,22,191,1,128
5230 DATA 1,9,128,4,191,1,128,23,143,1,191,5,143,1,128
5240 DATA 26,191,1,128,1,9,128,3,191,1,128,26,143,1
5250 DATA 191,1,143,1,128,28,191,1,128,1,9,128,3,191
5260 DATA 1,128,13,191,1,128,29,191,1,128,13,191,1,128
5270 DATA 1,9,128,3,191,1,128,13,191,1,128,29,191,1
5280 DATA 128,13,191,1,128,1,9,128,3,191,1,128,13
```

VIC-20/*Werewolf*

```
10 DIM EY(6,2),R$(2,22)
20 SQ$=CHR$(18)+CHR$(32)
30 ES=4256:SB=4096:CB=37888
40 POKE 36879,8:PRINT CHR$(147)
50 PRINT CHR$(5);TAB(5);"STAND BY ..."
60 FOR X=1 TO 6:FOR Y=1 TO 2
70 READ EY(X,Y):NEXT Y,X
80 FOR X=1 TO 2:FOR Y=1 TO 22
90 READ PR:R$(X,Y)=""
100 FOR Z=1 TO PR:READ KO,T
110 R$(X,Y)=R$(X,Y)+CHR$(KO)
120 FOR LN=1 TO T:R$(X,Y)=R$(X,Y)+SQ$
130 NEXT LN,Z,Y,X
140 FA=1:GOSUB 1000
150 DR=1000:GOSUB 2000
160 FOR X=1 TO RND(1)*9+4
170 POKE ES+1,195:POKE ES+8,195
180 FOR DE=1 TO RND(1)*250+25:NEXT DE
190 POKE ES+1,209:POKE ES+8,209
200 GOSUB 2000:NEXT X
210 FOR I=0 TO 3:FOR J=1 TO 5-I+(I=0)
220 POKE SB+I+22*J,160:POKE CB+I+22*J,1:NEXT J,I
230 DR=500:GOSUB 2000
240 POKE ES,209:POKE ES+1,160
250 POKE ES+7,209:POKE ES+8,160:GOSUB 2000
260 POKE ES,188:POKE ES+1,215
270 POKE ES+7,188:POKE ES+8,215
280 FOR X=1 TO 20
290 POKE CB+161,INT(RND(1)*7)+1
300 POKE CB+168,INT(RND(1)*7)+1:NEXT X
310 FA=2:GOSUB 1000
320 POKE SB+317,105:POKE CB+317,1
330 POKE SB+320,95:POKE CB+320,1
340 FOR DE=1 TO RND(1)*200+200
350 POKE CB+161,INT(RND(1)*7)+1
360 POKE CB+168,INT(RND(1)*7)+1
370 NEXT DE:GOTO 140
1000 PRINT CHR$(19);:FOR X=1 TO 22:PRINT R$(FA,X);
1010 IF X=8 THEN FOR Y=1 TO 6:POKE ES+EY(Y,2),EY(Y,1):
NEXT Y
1020 NEXT X:RETURN
2000 FOR DE=1 TO RND(1)*DR+DR:NEXT DE:RETURN
3000 DATA 188,0,209,1,190,2,188,7,209,8,190,9,3,144
3010 DATA 8,28,6,144,8,3,144,6,28,10,144,6,3,144,5,28
3020 DATA 12,144,5,3,144,4,28,14,144,4,5,144,3,28,4
3030 DATA 158,8,28,4,144,3,5,144,2,28,3,158,12,28,3
3040 DATA 144,2,9,144,2,28,2,158,2,28,3,158,4,28,3,158
3050 DATA 2,28,2,144,2,7,144,2,28,2,158,6,28,2,158,6
3060 DATA 28,2,144,2,7,144,2,28,2,158,6,28,2,158,6,28
3070 DATA 2,144,2,7,144,2,28,2,158,6,28,2,158,6,28,2
3080 DATA 144,2,7,144,2,28,1,158,6,28,4,158,6,28,1,144
3090 DATA 2,5,144,2,28,1,158,16,28,1,144,2,3,144,3,158
3100 DATA 16,144,3,5,144,3,158,4,28,8,158,4,144,3,7
3110 DATA 144,3,158,5,28,1,5,4,28,1,158,5,144,3,5,144
3120 DATA 4,158,5,28,4,158,5,144,4,3,31,4,158,14,31
3130 DATA 4,3,31,5,158,12,31,5,3,31,6,158,10,31,6,3
3140 DATA 31,7,158,8,31,7,3,31,8,158,6,31,8,1,31,22
4000 DATA 3,144,8,28,6,144,8,3,144,6,28,10,144,6,3,144
4010 DATA 5,28,12,144,5,5,28,1,144,3,28,14,144,3,28
4020 DATA 1,5,28,7,158,2,28,4,158,2,28,7,11,158,1,28
4030 DATA 4,158,2,28,1,158,2,28,2,158,2,28,1,158,2,28
4040 DATA 4,158,1,9,158,2,28,2,158,4,28,1,158,4,28,1
4050 DATA 158,4,28,2,158,2,9,28,1,158,1,28,2,158,6,144
4060 DATA 2,158,6,28,2,158,1,28,1,5,28,4,158,6,144,2
4070 DATA 158,6,28,4,7,144,1,28,3,158,6,144,2,158,6
4080 DATA 28,3,144,1,7,144,2,28,2,158,5,144,4,158,5
4090 DATA 28,2,144,2,5,144,2,28,4,158,10,28,4,144,2
4100 DATA 5,144,3,28,2,158,12,28,2,144,3,7,144,3,28
4110 DATA 2,158,2,28,8,158,2,28,2,144,3,10,144,3,28
4120 DATA 3,158,2,28,1,144,4,28,1,158,2,28,3,144,2,31
4130 DATA 1,7,31,4,28,3,158,2,28,4,158,2,28,3,31,4,5
4140 DATA 31,4,28,4,158,6,28,4,31,4,3,31,5,28,12,31
4150 DATA 5,3,31,6,28,10,31,6,3,31,7,28,8,31,7,3,31
4160 DATA 8,28,6,31,8,3,31,9,28,4,31,9
```

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BY DR. EDWARD D. WATSON
PROGRAM BY STEVEN C.M. CHEN

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The program presents twelve questions that address some of the most important fire facts and evacuation procedures. Respond to each question by pressing the T (true) or F (false) key. A counter keeps track of the number of correct responses and presents your score when the program is completed.

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To get more information on what to do in case of fire, contact your local fire department.

DR. EDWARD D. WATSON *is Professor of Elementary Education at Trenton State College. His articles have appeared in* Learning *and* Electronic Education *among other publications.*

IBM PC & compatibles (80-column version)/ *Fire Safety*

This program has been tested and found to work on the following computers and hardware configurations, using the BASICs shown: IBM PC w/Color/Graphics Monitor Adapter or Monochrome/Printer Card, w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr w/128K RAM, 80-column monitor, and Cartridge BASIC J1.00. Tandy 1000 w/80-column monitor, w/GW-BASIC 2.02 version 01.01.00. (IBM PCjr owners with 64K RAM should use the 40-column version.) It should also work on many other PC compatibles.

```
10 READ IC,QC,FF,CC,EC
20 DIM A$(QC),CM$(CC),EM$(EC),FM$(QC),IM$(IC),QM$(QC)
30 CT=0:SP$=CHR$(32):READ TT$
40 SW=80:KEY OFF
50 FOR L=1 TO IC:READ IM$(L):NEXT L
60 FOR L=1 TO QC:READ QM$(L),A$(L)
```


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CIRCLE READER SERVICE 61

```
70 IF A$(L)="F" AND FF THEN READ FM$(L)
80 NEXT L:FOR L=1 TO CC:READ CM$(L):NEXT L
90 READ RM$:FOR L=1 TO EC:READ EM$(L):NEXT L
100 GOSUB 1000:IF IC>1 THEN PF=-1 ELSE PF=0
110 C=1:M$=IM$(1):GOSUB 2000:GOSUB 3000
120 FOR L=1 TO QC:GOSUB 1000:M$=QM$(L)
130 GOSUB 2000:PRINT:PRINT "<T>rue or <F>alse? ";
140 GOSUB 5000:IF K$<>"T" AND K$<>"F" THEN 140
150 PRINT K$:PRINT:PRINT:PRINT
160 IF K$=A$(L) THEN M$=CM$(INT(RND*CC)+1):GOSUB 6000:
CT=CT+1:GOTO 200
170 PRINT "Sorry, the correct answer is ";A$(L);"."
180 FOR S=1 TO 3:SOUND 500,6:SOUND 800,5:NEXT S
190 IF A$(L)="F" AND FF THEN PRINT:M$=FM$(L):GOSUB 200
0
200 GOSUB 3000:NEXT L:CLS
210 PRINT "You had";CT;"correct out of";STR$(QC);"."
220 PRINT:IF CT=QC THEN M$=RM$:GOSUB 2000:END
230 FOR L=1 TO EC:M$=EM$(L):GOSUB 2000:NEXT L
240 PRINT:PRINT "Would you like to try again?";
250 GOSUB 5000:IF K$<>"Y" AND K$<>"N" THEN 250
260 IF K$="Y" THEN CT=0:GOTO 100 ELSE END
1000 CLS:COLOR 0,12:LOCATE 1,(SW-LEN(TT$))/2
1010 PRINT TT$:COLOR 2,0:PRINT:RETURN
2000 IF LEN(M$)>SW THEN 2040
2010 IF NOT PF THEN N$=M$:GOSUB 4000:RETURN
2020 C=C+1:M$=M$+SP$+SP$+IM$(C):IF C=IC THEN PF=0
2030 GOTO 2000
2040 Y=SW+1:Z=1:FOR X=Y TO 2 STEP -1
2050 IF MID$(M$,X,1)=SP$ THEN Z=0:Y=X:X=2
2060 NEXT X:N$=LEFT$(M$,Y-1):GOSUB 4000
2070 M$=RIGHT$(M$,LEN(M$)-Y+Z):GOTO 2000
3000 M$="PRESS <SPACE BAR> TO CONTINUE."
3010 LOCATE 23,1:GOSUB 6000
3020 IF INKEY$<>SP$ THEN 3020 ELSE RETURN
4000 IF LEN(N$)=SW THEN PRINT N$;:RETURN
4010 PRINT N$:RETURN
5000 K$=INKEY$:IF K$="" THEN 5000
5010 K=ASC(K$):K$=CHR$(K-(K>96)*(K<123)*32):RETURN
6000 PRINT TAB((SW-LEN(M$))/2);M$:RETURN
8000 DATA 3,12,-1,4,1,FIRE SAFETY
9000 DATA FIRE SAFETY is a True/False quiz that tests
your ability to plan for and react to the dangers of a
 residential fire.
9010 DATA Answer the following questions by pressing <
T> if the statement is true or <F> if the statement is
 not true.
9020 DATA "The more questions you answer correctly, th
e safer you are likely to be in the event of a fire."
9030 DATA 1. It is silly to practice home fire drills.
,F
9040 DATA Your family should hold regular fire drills
until everyone is clear on what to do in a fire emerge
ncy.
9050 DATA 2. It is important to plan at least two esca
pe routes from each room.,T
9060 DATA 3. You should not agree on a place to meet o
utside the house.,F
9070 DATA An outside meeting place well away from dang
er should be decided on so that you and the fire offic
ials will know if each member of your family is safe.
9080 DATA 4. The first priority in a house fire is to
get everyone out.,T
9090 DATA 5. One smoke detector provides maximum prote
ction in all homes.,F
9100 DATA "There should be at least one smoke detector
 on each floor or level of your house.  They should be
 placed on the ceiling near sleeping areas, away from
air-conditioning and heating vents."
9110 DATA 6. The most common fires in the home involve
 electrical appliances or wiring.,F
9120 DATA "Most fires are caused by combustible solids
, paper, wood, textiles, and rubbish."
9130 DATA "7. Don't call the fire department from the
burning home.  Get out safely, then telephone from a n
eighbor's house.",T
9140 DATA "8. Smoke and toxic gases, not flames, are t
he most dangerous elements of fire.",T
9150 DATA "9. If you must go through a smoke-filled ar
ea, you should crawl on your hands and knees, with you
r head low to avoid breathing smoke.",T
9160 DATA "10. Before opening an inside door, touch th
e knob and the top of the door.  If either feels hot,
don't open the door; use another exit.",T
9170 DATA "11. If your clothes are on fire, drop and r
oll.  Rolling smothers the flames.",T
9180 DATA 12. It is sometimes safe to go back into a b
urning building.,F
9190 DATA "Once outside, no one should return to the h
ouse for any reason."
9200 DATA Good thinking!,Terrific!
9210 DATA Fantastic!,Excellent!
9220 DATA Your sense of fire safety is good.
9230 DATA It is important that you answer all 12 quest
ions correctly to improve your fire-safety skills.
```

Apple II series/*Fire Safety*

```
10 READ IC,QC,FF,CC,EC
20 DIM A$(QC),CM$(CC),EM$(EC),FM$(QC),IM$(IC),QM$(QC)
30 SW = 40
40 CT = 0:SP$ = CHR$(32)
50 READ TT$:FOR L = 1 TO IC:READ IM$(L):NEXT L
60 FOR L = 1 TO QC:READ QM$(L),A$(L)
70 IF A$(L) = "F" AND FF THEN READ FM$(L)
80 NEXT L:FOR L = 1 TO CC:READ CM$(L):NEXT L
90 READ RM$:FOR L = 1 TO EC:READ EM$(L):NEXT L
100 GOSUB 1000:PF = 0:IF IC > 1 THEN PF = 1
110 C = 1:M$ = IM$(1):GOSUB 2000:GOSUB 3000
120 FOR L = 1 TO QC:GOSUB 1000:M$ = QM$(L)
130 GOSUB 2000:PRINT:PRINT "<T>RUE OR <F>ALSE? ";
140 GOSUB 5000:IF K$ <> "T" AND K$ <> "F" THEN 140
150 PRINT K$:PRINT:PRINT:PRINT
160 IF K$ = A$(L) THEN M$ = CM$(INT(RND(1)*CC)+1):GOSU
B 6000:CT = CT+1:GOTO 210
170 PRINT "SORRY, THE CORRECT ANSWER IS ";A$(L);"."
180 FOR S = 1 TO 3:PRINT CHR$(7);:FOR D = 1 TO 20
190 NEXT D:PRINT CHR$(7);:NEXT S
200 IF A$(L) = "F" AND FF THEN PRINT:M$ = FM$(L):GOSUB
 2000
210 GOSUB 3000:NEXT L:HOME
220 PRINT "YOU HAD ";CT;" CORRECT OUT OF ";QC;"."
230 PRINT:IF CT = QC THEN M$ = RM$:GOSUB 2000:END
240 FOR L = 1 TO EC:M$ = EM$(L):GOSUB 2000:NEXT L
250 PRINT:PRINT "WOULD YOU LIKE TO TRY AGAIN? ";
260 GOSUB 5000:IF K$ <> "Y" AND K$ <> "N" THEN 260
270 IF K$ = "Y" THEN CT = 0:GOTO 100
280 END
1000 HOME:INVERSE:HTAB (SW-LEN(TT$))/2
1010 PRINT TT$:NORMAL:PRINT:RETURN
2000 IF LEN(M$) > SW THEN 2050
2010 IF NOT PF THEN N$ = M$:GOSUB 4000:RETURN
2020 C = C+1:M$ = M$+SP$+SP$+IM$(C)
2030 IF C = IC THEN PF = 0
2040 GOTO 2000
2050 Y = SW+1:Z = 1:FOR X = Y TO 2 STEP -1
2060 IF MID$(M$,X,1) = SP$ THEN Z = 0:Y = X:X = 2
2070 NEXT X:N$ = LEFT$(M$,Y-1):GOSUB 4000
2080 M$ = RIGHT$(M$,LEN(M$)-Y+Z):GOTO 2000
3000 M$ = "PRESS <SPACE BAR> TO CONTINUE."
3010 VTAB 23:HTAB 1:GOSUB 6000
3020 GOSUB 5000:ON K <> 32 GOTO 3020:RETURN
4000 IF LEN(N$) = SW THEN PRINT N$;:RETURN
4010 PRINT N$:RETURN
5000 GET K$:K = ASC(K$):IF K = 3 THEN PRINT:END
5010 K$ = CHR$(K-(K > 96)*(K < 123)*32):RETURN
6000 PRINT TAB((SW-LEN(M$))/2);M$;:RETURN
```

After you have typed in the above lines, add the DATA statements (lines 8000-9230) from the IBM PC 80-column version.

Atari 400/800, 600/800XL, & 130XE/*Fire Safety*

```
10 READ IC,QC,FF,CC,EC,SL
20 DIM A$(QC),CM$(CC*SL),EM$(EC*SL),FM$(QC*SL)
30 DIM IM$(IC*SL),K$(1),M$(SL),N$(SL),Q$(1)
40 DIM QM$(QC*SL),RM$(SL),SP$(1),TT$(40),X$(SL)
50 DIM Y$(SL),Z$(SL)
60 SS=PEEK(82):POKE 82,0:OPEN #1,4,0,"K:"
70 CT=0:SP$=CHR$(32):Q$=CHR$(34):READ TT$
80 FOR L=1 TO IC:GOSUB 1000:IM$(SL*L-SL+1)=X$:NEXT L
90 FOR L=1 TO QC:GOSUB 1000
100 QM$(L*SL-SL+1)=X$:READ X$:A$(L,L)=X$
110 IF A$(L,L)="F" AND FF THEN GOSUB 1000:FM$(L*SL-SL+
1)=X$
120 NEXT L:FOR L=1 TO CC:GOSUB 1000
130 CM$(L*SL-SL+1)=X$:NEXT L:READ RM$
140 FOR L=1 TO EC:GOSUB 1000:EM$(L*SL-SL+1)=X$:NEXT L
150 GOSUB 2000:PF=0:IF IC>1 THEN PF=-1
160 C=1:M$=IM$(1,ASC(IM$(SL))):GOSUB 3000:GOSUB 4000
170 FOR L=1 TO QC:GOSUB 2000
180 M$=QM$(L*SL-SL+1,L*SL-(SL-ASC(QM$(L*SL))))
190 GOSUB 3000:PRINT :PRINT "<T>rue or <F>alse? ";
200 GOSUB 6000:IF K$<>"T" AND K$<>"F" THEN 200
210 PRINT K$:PRINT :PRINT :PRINT
220 IF K$=A$(L,L) THEN X=INT(RND(0)*CC)+1:M$=CM$(X*SL-
SL+1,X*SL-(SL-ASC(CM$(X*SL)))):GOSUB 7000:CT=CT+1:GOTO
 260
230 PRINT "Sorry, the correct answer is ";A$(L,L);"."
240 FOR S=15 TO 0 STEP -1:SOUND 1,10,12,S:NEXT S
250 IF A$(L,L)="F" AND FF THEN PRINT :M$=FM$(L*SL-SL+1
,L*SL-(SL-ASC(FM$(L*SL)))):GOSUB 3000
260 GOSUB 4000:NEXT L:PRINT CHR$(125);
270 PRINT "You had ";CT;" correct out of ";STR$(QC);".
"
280 PRINT :IF CT=QC THEN M$=RM$:GOSUB 3000:END
290 FOR L=1 TO EC:M$=EM$(L*SL-SL+1,L*SL-(SL-ASC(EM$(L*
SL)))):GOSUB 3000:NEXT L
300 PRINT :PRINT "Would you like to try again?";
310 GOSUB 6000:IF K$<>"Y" AND K$<>"N" THEN 310
320 IF K$="Y" THEN CT=0:GOTO 150
330 POKE 82,SS:END
1000 Y$="":F=0
1010 READ X$:LX=LEN(X$):LY=LEN(Y$):Y$(LEN(Y$)+1)=X$
1020 IF X$(1,1)=Q$ THEN X$=Y$(2+LY):Y$(LY+1)=X$:F=1:IF
 Y$(LEN(Y$))<>Q$ THEN Y$(LEN(Y$)+1)=",":GOTO 1010
1030 IF F AND Y$(LEN(Y$))=Q$ THEN Y$=Y$(1,LEN(Y$)-1):G
OTO 1050
1040 IF F THEN Y$(LEN(Y$)+1)=",":GOTO 1010
1050 IF Y$(LEN(Y$))="+" THEN Y$=Y$(1,LEN(Y$)-1):F=0:GO
TO 1010
1060 X$=Y$:X$(SL)=CHR$(LEN(Y$)):RETURN
2000 GRAPHICS 0:POSITION (40-LEN(TT$))/2-1,0
2010 PRINT TT$:PRINT :RETURN
3000 IF LEN(M$)>40 THEN 3060
3010 IF  NOT PF THEN N$=M$:GOSUB 5000:RETURN
3020 C=C+1:X=LEN(M$):M$(X+1)=SP$:M$(X+2)=SP$
3030 M$(X+3)=IM$(C*SL-SL+1,C*SL-(SL-ASC(IM$(C*SL))))
3040 IF C=IC THEN PF=0
3050 GOTO 3000
3060 Y=41:Z=1:FOR X=Y TO 2 STEP -1
3070 IF M$(X,X)=SP$ THEN Z=0:Y=X:X=2
3080 NEXT X:N$=M$(1,Y-1):GOSUB 5000
3090 M$=M$(Y+Z+1):GOTO 3000
4000 M$="PRESS <SPACE BAR> TO CONTINUE."
4010 POSITION 0,22:POKE 752,1:GOSUB 7000:POKE 752,0
4020 GET #1,INKEY:IF INKEY<>32 THEN 4020
4030 RETURN
5000 IF LEN(N$)=40 THEN PRINT N$;:RETURN
5010 PRINT N$:RETURN
6000 GET #1,K
6010 K$=CHR$(K-(K>96)*(K<123)*32):RETURN
7000 POKE 85,(40-LEN(M$))/2:PRINT M$:RETURN
8000 DATA 3,12,-1,4,1,255,FIRE SAFETY
9000 DATA FIRE SAFETY IS A TRUE/FALSE QUIZ THAT +
9010 DATA TESTS YOUR ABILITY TO PLAN FOR AND REACT +
9020 DATA TO THE DANGERS OF A RESIDENTIAL FIRE.
9030 DATA ANSWER THE FOLLOWING QUESTIONS BY PRESSING +
9040 DATA <T> IF THE STATEMENT IS TRUE OR <F> IF THE +
```


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```
9050 DATA STATEMENT IS NOT TRUE.
9060 DATA "THE MORE QUESTIONS YOU ANSWER CORRECTLY, +"
9070 DATA THE SAFER YOU ARE LIKELY TO BE IN THE +
9080 DATA EVENT OF A FIRE.
9090 DATA 1. IT IS SILLY TO PRACTICE HOME +
9100 DATA FIRE DRILLS.,F
9110 DATA YOUR FAMILY SHOULD HOLD REGULAR FIRE +
9120 DATA DRILLS UNTIL EVERYONE IS CLEAR ON WHAT TO +
9130 DATA DO IN A FIRE EMERGENCY.
9140 DATA 2. IT IS IMPORTANT TO PLAN AT LEAST +
9150 DATA TWO ESCAPE ROUTES FROM EACH ROOM.,T
9160 DATA 3. YOU SHOULD NOT AGREE ON A PLACE TO MEET +
9170 DATA OUTSIDE THE HOUSE.,F
9180 DATA AN OUTSIDE MEETING PLACE WELL AWAY +
9190 DATA FROM DANGER SHOULD BE DECIDED ON SO +
9200 DATA THAT YOU AND THE FIRE OFFICIALS WILL +
9210 DATA KNOW IF EACH MEMBER OF YOUR FAMILY IS SAFE.
9220 DATA 4. THE FIRST PRIORITY IN A HOUSE FIRE IS +
9230 DATA TO GET EVERYONE OUT.,T
9240 DATA 5. ONE SMOKE DETECTOR PROVIDES MAXIMUM +
9250 DATA PROTECTION IN ALL HOMES.,F
9260 DATA THERE SHOULD BE AT LEAST ONE SMOKE +
9270 DATA DETECTOR ON EACH FLOOR OR LEVEL OF +
9280 DATA YOUR HOUSE.  THEY SHOULD BE PLACED ON +
9290 DATA "THE CEILING NEAR SLEEPING AREAS, AWAY +"
9300 DATA FROM AIR-CONDITIONING AND HEATING VENTS.
9310 DATA 6. THE MOST COMMON FIRES IN THE HOME +
9320 DATA INVOLVE ELECTRICAL APPLIANCES OR WIRING.,F
9330 DATA MOST FIRES ARE CAUSED BY COMBUSTIBLE +
9340 DATA "SOLIDS, PAPER, WOOD, TEXTILES, +"
9350 DATA AND RUBBISH.
9360 DATA 7. DON'T CALL THE FIRE DEPARTMENT +
9370 DATA FROM THE BURNING HOME.  GET OUT +
9380 DATA "SAFELY, THEN TELEPHONE FROM A +"
9390 DATA NEIGHBOR'S HOUSE.,T
9400 DATA "8. SMOKE AND TOXIC GASES, NOT FLAMES, +"
9410 DATA ARE THE MOST DANGEROUS ELEMENTS OF FIRE.,T
9420 DATA 9. IF YOU MUST GO THROUGH A SMOKE-FILLED +
9430 DATA "AREA, YOU SHOULD CRAWL ON YOUR HANDS AND +"
9440 DATA "KNEES, WITH YOUR HEAD LOW TO AVOID +"
9450 DATA BREATHING SMOKE.,T
9460 DATA "10. BEFORE OPENING AN INSIDE DOOR, TOUCH +"
9470 DATA THE KNOB AND THE TOP OF THE DOOR.  IF +
9480 DATA "EITHER FEELS HOT, DON'T OPEN THE DOOR; +"
9490 DATA USE ANOTHER EXIT.,T
9500 DATA "11. IF YOUR CLOTHES ARE ON FIRE, DROP +"
9510 DATA AND ROLL.  +
9520 DATA ROLLING SMOTHERS THE FLAMES.,T
9530 DATA 12. IT IS SOMETIMES SAFE TO GO BACK INTO A +
9540 DATA BURNING BUILDING.,F
9550 DATA "ONCE OUTSIDE, NO ONE SHOULD RETURN TO +"
9560 DATA THE HOUSE FOR ANY REASON.
9570 DATA GOOD THINKING!,TERRIFIC!
9580 DATA FANTASTIC!,EXCELLENT!
9590 DATA YOUR SENSE OF FIRE SAFETY IS GOOD.
9600 DATA IT IS IMPORTANT THAT YOU ANSWER ALL 12 +
9610 DATA QUESTIONS CORRECTLY TO IMPROVE YOUR +
9620 DATA FIRE-SAFETY SKILLS.
```

Commodore 64 & 128 (C 64 mode)/*Fire Safety*

```
10 READ IC,QC,FF,CC,EC
20 DIM A$(QC),CM$(CC),EM$(EC),FM$(QC),IM$(IC),QM$(QC)
30 CT=0:SP$=CHR$(32)
40 READ TT$:FOR L=1 TO IC:GOSUB 1000:IM$(L)=X$:NEXT L
50 FOR L=1 TO QC:GOSUB 1000:QM$(L)=X$
60 GOSUB 1000:A$(L)=X$
70 IF A$(L)="F" AND FF THEN GOSUB 1000:FM$(L)=X$
80 NEXT L:FOR L=1 TO CC:READ CM$(L):NEXT L
90 GOSUB 1000:RM$=X$
100 FOR L=1 TO EC:GOSUB 1000:EM$(L)=X$:NEXT L
110 GOSUB 2000:PF=0:IF IC>1 THEN PF=-1:GOTO 120
120 C=1:M$=IM$(1):GOSUB 3000:GOSUB 4000
130 FOR L=1 TO QC:GOSUB 2000:M$=QM$(L)
140 GOSUB 3000:PRINT:PRINT "<T>RUE OR <F>ALSE? ";
150 GOSUB 6000:IF K$<>"T" AND K$<>"F" THEN 150
160 PRINT K$:PRINT:PRINT:PRINT
170 IF K$=A$(L) THEN M$=CM$((RND(1)*CC)+1):PRINT:GOSUB
 7000:CT=CT+1:GOTO 200
180 PRINT "SORRY, THE CORRECT ANSWER IS ";A$(L);"."
190 IF A$(L)="F" AND FF THEN PRINT:M$=FM$(L):GOSUB 300
0
200 GOSUB 4000:NEXT L:PRINT CHR$(147);
210 PRINT "YOU HAD";CT;"CORRECT OUT OF ";STR$(QC);"."
220 PRINT:IF CT=QC THEN M$=RM$:GOSUB 3000:END
230 FOR L=1 TO EC:M$=EM$(L):GOSUB 3000:NEXT L
240 PRINT:PRINT "WOULD YOU LIKE TO TRY AGAIN?";
250 GOSUB 6000:IF K$<>"Y" AND K$<>"N" THEN 250
260 IF K$="Y" THEN CT=0:GOTO 110
270 END
1000 X$=""
1010 READ S$:IF RIGHT$(S$,1)="+" THEN X$=X$+LEFT$(S$,L
EN(S$)-1):GOTO 1010
1020 X$=X$+S$:RETURN
2000 PRINT CHR$(147);CHR$(5);TAB(20-LEN(TT$)/2);TT$
2010 PRINT CHR$(154):RETURN
3000 IF LEN(M$)>40 THEN 3040
3010 IF NOT PF THEN N$=M$:GOSUB 5000:RETURN
3020 C=C+1:M$=M$+SP$+SP$+IM$(C):IF C=IC THEN PF=0
3030 GOTO 3000
3040 Y=41:Z=1:FOR X=Y TO 2 STEP -1
3050 IF MID$(M$,X,1)=SP$ THEN Z=0:Y=X:X=2
3060 NEXT X:N$=LEFT$(M$,Y-1):GOSUB 5000
3070 M$=RIGHT$(M$,LEN(M$)-Y+Z):GOTO 3000
4000 M$="PRESS <SPACE BAR> TO CONTINUE."
4010 POKE 214,22:PRINT:GOSUB 7000
4020 GET K$:IF K$<>SP$ THEN 4020
4030 RETURN
5000 IF LEN(N$)=40 THEN PRINT N$;:RETURN
5010 PRINT N$:RETURN
6000 GET K$:IF K$="" THEN 6000
6010 K=ASC(K$):K$=CHR$(K-(K>96)*(K<123)*32):RETURN
7000 PRINT TAB(20-LEN(M$)/2);M$:RETURN
```

After you have typed in the above lines, add the DATA statements (lines 8000-9620) from the Atari version.

Tandy Color Computer/*Fire Safety*

```
10 CLEAR 3000:READ IC,QC,FF,CC,EC
20 DIM A$(QC),CM$(CC),EM$(EC),FM$(QC),IM$(IC),QM$(QC)
30 SW=32
40 CT=0:SP$=CHR$(32)
50 READ TT$:FOR L=1 TO IC:READ IM$(L):NEXT L
60 FOR L=1 TO QC:READ QM$(L),A$(L)
70 IF A$(L)="F" AND FF THEN READ FM$(L)
80 NEXT L:FOR L=1 TO CC:READ CM$(L):NEXT L
90 READ RM$:FOR L=1 TO EC:READ EM$(L):NEXT L
100 GOSUB 1000:IF IC>1 THEN PF=-1 ELSE PF=0
110 C=1:M$=IM$(1):GOSUB 2000:GOSUB 3000
120 FOR L=1 TO QC:GOSUB 1000:M$=QM$(L)
130 GOSUB 2000:PRINT:PRINT "<T>RUE OR <F>ALSE? ";
140 GOSUB 5000:IF K$<>"T" AND K$<>"F" THEN 140
150 PRINT K$:PRINT
160 IF K$=A$(L) THEN M$=CM$(RND(CC)):GOSUB 6000:CT=CT+
1:GOTO 200
170 PRINT "SORRY, THE CORRECT ANSWER IS ";A$(L);"."
180 FOR S=1 TO 3:SOUND 150,3:SOUND 100,2:NEXT S
190 IF A$(L)="F" AND FF THEN PRINT:M$=FM$(L):GOSUB 200
0
200 GOSUB 3000:NEXT L:CLS
210 PRINT "YOU HAD";CT;"CORRECT OUT OF";STR$(QC);"."
220 PRINT:IF CT=QC THEN M$=RM$:GOSUB 2000:END
230 FOR L=1 TO EC:M$=EM$(L):GOSUB 2000:NEXT L
240 PRINT:PRINT "WOULD YOU LIKE TO TRY AGAIN?";
250 GOSUB 5000:IF K$<>"Y" AND K$<>"N" THEN 250
260 IF K$="Y" THEN CT=0:GOTO 100 ELSE END
1000 CLS:PRINT@(SW-LEN(TT$))/2,TT$:RETURN
2000 IF LEN(M$)>SW THEN 2040
2010 IF NOT PF THEN N$=M$:GOSUB 4000:RETURN
2020 C=C+1:M$=M$+SP$+SP$+IM$(C):IF C=IC THEN PF=0
2030 GOTO 2000
```

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CIRCLE READER SERVICE 3

```
2040 Y=SW+1:Z=1:FOR X=Y TO 2 STEP -1
2050 IF MID$(M$,X,1)=SP$ THEN Z=0:Y=X:X=2
2060 NEXT X:N$=LEFT$(M$,Y-1):GOSUB 4000
2070 M$=RIGHT$(M$,LEN(M$)-Y+Z):GOTO 2000
3000 M$="PRESS <SPACE BAR> TO CONTINUE."
3010 PRINT@SW*15,"";:GOSUB 6000
3020 K$=INKEY$:IF K$<>SP$ THEN 3020 ELSE RETURN
4000 IF LEN(N$)=SW THEN PRINT N$;:RETURN
4010 PRINT N$:RETURN
5000 K$=INKEY$:IF K$="" THEN 5000
5010 K=ASC(K$):K$=CHR$(K-(K>96)*(K<123)*32):RETURN
6000 PRINT TAB((SW-LEN(M$))/2);M$;:RETURN
```

After you have typed in the above lines, add the DATA statements (lines 8000-9230) from the IBM PC 80-column version.

MODIFICATIONS FOR OTHER COMPUTERS

IBM PC & compatibles (40-column version)/*Fire Safety*

This program has been tested and found to work on the following computers and hardware configurations, using the BASICs shown: IBM PC w/Color/Graphics Monitor Adapter, w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr w/Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 01.01.00. It should also work on many other PC compatibles.

Use the IBM PC 80-column version, except change line 40 to read as follows:

```
40 SW=40:KEY OFF
```

Macintosh w/Microsoft BASIC 2.0 or 2.1/*Fire Safety*

Use the IBM PC 80-column version, except change lines 40, 1000, and 1010 to read as follows:

```
40 SW=84:CALL TEXTFONT(4):CALL TEXTSIZE(9):WINDOW 1,TT
$,(0,38)-(527,338):WIDTH 85
1000 CLS:PRINT
1010 RETURN
```

Tandy Models III & 4 (Model III mode)/*Fire Safety*

Use the Color Computer version with the following alterations: Delete line 180. Also, change line 30 to read as follows:

```
30 SW=64
```

PROGRAMMING P.S.

Corrections and Enhancements to Previous Months' Programs

Maze Creator *(May 1986, page 64)*

IBM PC & compatibles w/printer: When using option number 5 (for printers with Epson-compatible graphics), an "Illegal function call" error occurs when you try to print a maze with a width between 23 and 41. To solve this problem, change line 4030 to read as follows:

```
4030 WIDTH "LPT1:",255:MB=6*MX:LB=INT(MB/256):FB=MB-LB
*256
```

The technical reason for this change is that when PC BASIC assigns a fractional value to an integer variable—the value is rounded, not truncated.

Thanks to George L. Martin of Madison, Wisconsin, for calling this mistake to our attention. Martin also suggests an enhancement:

"I found that our PC*jr* (128K) is capable of printing much larger mazes than the limits imposed by line 80. We produced a 79 x 99 maze . . . after changing lines 20 and 80 to

```
20 SW=80
80 XR(1)=79:XR(2)=69:YR(1)=99:YR(2)=23
```

"The larger mazes really get interesting! And if they are too complicated to solve, you can use them as modern art."

Answer: *1040ST*™

Question: *Which computer was specially designed for people who hate to wait?*

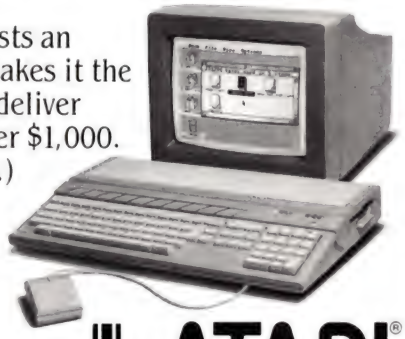
Let's face it, any time you spend waiting on a computer is time wasted. That's why Atari® built the 1040ST with a sizzling clock speed of 8 MHz.

And with 1024K bytes of Random Access Memory, the ST™ gives you an incredible combination of power and speed. (The PC AT,™ for example, has 512K of memory.)

So you'll spend time working on your ST, instead of waiting on it.

In addition, the 1040ST costs an amazingly low 999^{95}, which makes it the first computer in the world to deliver 1 Megabyte of memory for under $1,000. (The PC AT costs about $4,500.)

So if you haven't checked out the ST yet, what are you waiting for?



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Family Computing October 1986

COOKING CALCULATOR

PROGRAM BY STEVEN C.M. CHEN
INTRODUCTION BY KAREN KANE

Every fall, my school used to have a fair and a bake sale for which my mother contributed her scrumptious sugar-and-spice cookies. As the demand for these goodies grew from year to year, so did the recipe.

Changing the recipe proportions so that she could make six or seven dozen instead of two dozen cookies was no easy task. I would listen to my mother struggling with the math out loud: "Let's see, three teaspoons in a tablespoon. Two tablespoons in an ounce. That makes. . . ." She was never really sure whether her calculations were correct until the cookies passed the taste test. Too bad she didn't have this month's Home Helper program, *Cooking Calculator*, to reassure her.

When you run *Cooking Calculator*, you enter up to 50 ingredients in a recipe, their respective quantities, the number of people the recipe serves, and the number of desired servings. *Cooking Calculator* allows you to easily update a recipe to serve fewer or more people. The program automatically recalculates the ingredient quantities and converts the unit of measure if necessary (e.g., from 16 tablespoons to one cup) to match the number of servings you specify. You may print either the original amounts or the new ones. You have the option of changing the number of servings as many times as you'd like or entering a new recipe for conversion.

HOW TO USE THE PROGRAM

When you enter a recipe, the program will accept only whole numbers and fractions for the ingredient amounts and only whole numbers for the number of servings. Type the quantity, using a hyphen and/or slash if needed (e.g., 2, ½, 3-¼). Don't worry if you accidentally add spaces between characters, but decimals will not be accepted.

The units of measure that the program can convert include teaspoons, tablespoons, fluidounces, cups, pints, quarts, gallons, avdp. ounces, and pounds. (Avdp. stands for the French word "avoirdupois," meaning weight. An avdp. ounce measures weight—there are 16 avdp. ounces in a pound—whereas a fluidounce measures volume and converts into teaspoons, tablespoons, cups, pints, quarts, and gallons.)

To select a measuring unit, press the space bar to advance through the list and press ENTER or RETURN at the appropriate unit. If you are using an ingredient that is not expressed in one of the standard measurements listed, choose [OTHER] from the list and add the size or unit of measurement when you input the ingredient name. For example, [OTHER] would be used when adding a package of yeast, an apple, or a pinch of salt to your recipe.

If you make a mistake while entering an ingredient, never fear. The program asks if your entry is correct before proceeding to the next ingredient. If you type N, you need to reenter all of the information for that ingredient. If there are no more ingredients, simply press RETURN or ENTER instead of giving a quantity for the next item. Here again, the program will ask if there are any more ingredients in your recipe.

SPLITTING HAIRS

When *Cooking Calculator* increases or decreases a recipe, the ingredient proportions will be given in exact amounts rather than rounding to the nearest cooking standard. As a result, you will get fractions like $1\frac{17}{32}$ pints of molasses or $2\frac{63}{64}$ pounds of ground beef. Do your best to estimate the correct amount with standard measurement tools. In most cases, slight variations will not change the outcome significantly. Use your common sense; if the new recipe calls for $1\frac{17}{32}$ pints molasses, 1½ pints is close enough.

You can also estimate the number of servings that a recipe makes if that information is not given or if you are planning especially large or small portions. If you know you want to cut a recipe in half, it doesn't matter whether you specify the original quantity as two dozen and the new quantity as one, or the original quantity as 100 dozen and the new as 50; in both cases, the program will simply divide the amount of each ingredient by 2.

Ingredients like eggs, which don't divide easily, should be rounded to the nearest whole number and replaced with small-or

```
Sugar-and-Spice Cookies
---------------------------------------
3/4          cup shortening
1            cup sugar
1            egg
1/4          cup molasses
2            cups flour
2            teaspoons baking soda
1/4          teaspoon salt
1            teaspoon cinnamon
3/4          teaspoon cloves
3/4          teaspoon ginger
---------------------------------------
Number of servings: 2
```

```
Sugar-and-Spice Cookies
---------------------------------------
1-5/16       pints shortening
1-3/4        pints sugar
3-1/2        egg
7/8          cup molasses
1-3/4        quarts flour
2-1/3        tablespoons baking soda
7/8          teaspoon salt
1-1/6        tablespoons cinnamon
2-5/8        teaspoons cloves
2-5/8        teaspoons ginger
---------------------------------------
Number of servings: 7
```

large-size eggs, depending on the conversion. Similarly, you may not want to increase some spices, like salt, proportionately, and should spice to taste. My mother knew that if she increased the amount of cloves and ginger in her sugar-and-spice recipe too much, the cookies would be too spicy.

You must take into consideration the preparation time, cooking time, and pan or bowl size as your recipe size changes; the program can't calculate these factors for you. Also, keep in mind that some cookbooks warn against multiplying a recipe more than four times. Happy cooking!

COMMON WEIGHTS AND MEASURES

Dash = ⅛ Teaspoon or less

3 teaspoons = 1 tablespoon

2 Tablespoons = 1 fluidounce

16 Tablespoons = 1 cup

8 fluidounces = 1 cup

2 cups = 1 pint

4 cups = 1 quart

4 quarts = 1 gallon

16 avdp. ounces = 1 pound

Apple II series w/80-column printer/*Cooking Calculator*

```
10 DIM CUNIT(10),DV(6),M(50,2),NS(2),Q(50,3,2)
20 DIM IG$(50),MUNIT$(10),S$(1):DA$ = CHR$(45)
30 SP$ = CHR$(32):S$(0) = "":S$(1) = "S"
40 BL$ = SP$:FOR L = 2 TO 160:BL$ = BL$+SP$:NEXT L
50 LI$ = DA$:FOR L = 2 TO 39:LI$ = LI$+DA$:NEXT L
60 FOR L = 1 TO 6:READ DV(L):NEXT L
70 FOR L = 1 TO 10:READ MUNIT$(L),CUNIT(L):NEXT L
80 GOSUB 2000:INPUT "RECIPE NAME: ";RN$
90 T = LEN(RN$):IF T > 40 THEN 80
100 LM = INT(40-T)/2:IC = 1
110 GOSUB 2000:PRINT TAB(LM+1);RN$
120 VTAB 5:PRINT LI$
130 VTAB 6:HTAB 14:PRINT "INGREDIENT ";IC
140 VTAB 19
150 PRINT "TYPE THE QUANTITY USING A HYPHEN AND/OR"
160 PRINT "SLASH IF NEEDED (E.G., 2, 1/2, 3-1/4)"
170 PRINT "AND PRESS <RETURN>.  JUST PRESS <RETURN>";
180 PRINT "IF THERE ARE NO MORE INGREDIENTS."
190 VTAB 8:INPUT "HOW MANY? ";T$:PC = LEN(T$)
200 IF PC = 0 OR VAL(T$) = 0 THEN ON IC = 1 GOTO 330:G
OTO 530
210 F$ = "-":GOSUB 3000:PA = T
220 F$ = "/":GOSUB 3000:PB = T
230 F$ = ".":GOSUB 3000:PD = T
240 IF PA > PB OR PB = PC OR PA = 1 OR PB = 1 OR PD <>
 0 THEN 330
250 IF PA <> 0 THEN 280
260 IF PB <> 0 THEN A = 0:GOTO 290
270 A = VAL(T$):B = 0:C = 0:GOTO 340
280 A = VAL(LEFT$(T$,PA-1))
290 B = VAL(MID$(T$,PA+1,PB-PA))
300 C = VAL(MID$(T$,PB+1,PC-PB))
310 IF C < 1 OR C > 999 THEN 330
320 IF B < C AND (B > 0 OR C = 0) THEN 340
330 VTAB 8:PRINT CHR$(7);BL$:GOTO 140
340 VTAB 19:PRINT BL$:Q(IC,1,1) = A:Q(IC,2,1) = B
350 Q(IC,3,1) = C:V = A+B/(C-(C = 0)):VTAB 20
360 PRINT "PRESS <SPACE BAR> FOR NEXT MEASUREMENT"
370 PRINT "UNIT OR <RETURN> TO ACCEPT."
380 VTAB 9:PRINT "WHAT UNIT?":S = 1
390 VTAB 9:HTAB 12
400 PRINT MUNIT$(S);S$(ABS((V > 1)*(S <> 10)));LEFT$(B
L$,7)
410 GOSUB 4000:IF K <> 32 AND K <> 13 THEN 410
420 IF K = 32 THEN S = S+1:S = S-10*(S = 11):GOTO 390
430 M(IC,1) = S:VTAB 19:PRINT BL$
440 VTAB 10:INPUT "WHAT INGREDIENT? ";T$
450 IF T$ = "" THEN 440
460 IG$(IC) = T$:PRINT LI$
470 PRINT "IS THIS CORRECT? ";:GOSUB 5000
480 PRINT K$:IF K$ = "N" THEN 110
490 IC = IC+1:IF IC < 51 THEN 110
```

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CIRCLE READER SERVICE 31

Answer: *1040ST*™

Question: *Which computer builds in multiple features instead of hidden costs?*

It seems that a lot of our competitors design stripped down computers, and then charge extra for every feature and upgrade you add.

Atari® doesn't do that, because we believe the features and level of performance you want should be built in to begin with.

That's why the 1040ST gives you a full Megabyte of memory. While the competition only gives you the chance to spend big dollars trying to improve their memories.

Another trick they use is to make sure their interfaces don't meet industry standards, so you're locked into their system. In contrast, the ST™ uses standard interfaces across the board, such as the RS-232C port for serial modem communications and the parallel interface for an industry standard printer.

Of course, the ST's best built-in is the price, which is an incredible $999.95!

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ATARI®


```
500 PRINT LI$
510 PRINT "THERE IS NO ROOM FOR ANY MORE"
520 PRINT "INGREDIENTS.":GOSUB 6000:GOTO 560
530 VTAB 19:PRINT BL$:VTAB 9:PRINT LI$
540 PRINT "IS THIS THE LAST INGREDIENT? ";
550 GOSUB 5000:IF K$ = "N" THEN 110
560 IC = IC-1:GOSUB 2000
570 INPUT "HOW MANY SERVINGS DOES THIS RECIPE MAKE? ";
T$
580 T = VAL(T$):IF T < 1 OR INT(T) <> T THEN 570
590 NS(1) = T:GOSUB 2000
600 PRINT "ORIGINAL RECIPE SERVES ";NS(1);".":PRINT
610 INPUT "HOW MANY SERVINGS DO YOU WANT TO MAKE?  ";T
$
620 T = VAL(T$):IF T < 1 OR INT(T) <> T THEN 610
630 NS(2) = T:MF = NS(2)/NS(1):GOSUB 2000
640 IF MF = 1 THEN RS = 1:GOTO 1000
650 FOR L = 1 TO IC:SEL = M(L,1):A = Q(L,1,1)
660 B = Q(L,2,1):C = Q(L,3,1):IF C = 0 THEN C = 1
670 B = (A*C+B)*NS(2):C = C*NS(1)
680 A = INT(B/C):B = B-A*C:IF MF < 1 THEN 770
690 IF SEL = 7 OR SEL > 8 THEN 880
700 IF SEL = 8 THEN RA = 8:RB = 8:GOTO 720
710 RA = SEL:RB = 6-(SEL < 3)
720 FOR R = RA TO RB:FA = CUNIT(SEL)
730 IF (A < FA) THEN R = RB:GOTO 760
740 T = INT(A/FA):B = B+(A-T*FA)*C:A = T
750 C = C*FA:SEL = SEL+1+(SEL = 2)
760 NEXT R:GOTO 880
770 IF A > 0 THEN 880
780 IF SEL = 1 OR SEL = 8 OR SEL = 10 THEN 880
790 IF SEL = 9 THEN RA = 8:RB = 8:GOTO 810
800 RA = SEL-1-(SEL = 4):RB = 1
810 FOR R = RA TO RB STEP -1
820 IF SEL = 3 THEN FA = 2:SEL = 2:GOTO 840
830 SEL = SEL-1-(SEL = 4):FA = CUNIT(SEL)
840 B = FA*B:IF B < C THEN 870
850 R = RB:IF B = C THEN A = 1:B = 0:C = 0:GOTO 870
860 A = INT(B/C):B = B-A*C
870 NEXT R
880 IF B < 2 THEN 930
890 IF C/B = INT(C/B) THEN C = C/B:B = 1:GOTO 930
900 FOR X = 1 TO 6:D = DV(X)
910 IF B/D = INT(B/D) AND C/D = INT(C/D) THEN B = B/D:
C = C/D:GOTO 910
920 NEXT X
930 Q(L,1,2) = A:Q(L,2,2) = B:Q(L,3,2) = C
940 M(L,2) = SEL:NEXT L
950 PRINT "PRINT RECIPE WITH <N>EW OR <O>RIGINAL"
960 PRINT "NUMBER OF SERVINGS? ";
970 GOSUB 4000:RS = ABS((K$ = "O")+(K$ = "N")*2)
980 IF RS = 0 THEN 970
990 PRINT K$:PRINT
1000 PRINT "PRESS ANY KEY WHEN PRINTER IS READY.";
1010 GOSUB 4000:PRINT:PRINT CHR$(4);"PR#1"
1020 PRINT TAB(LM+20);RN$:PRINT LI$;LI$;DA$
1030 FOR L = 1 TO IC:MAX = 11:A = Q(L,1,RS)
1040 B = Q(L,2,RS):C = Q(L,3,RS):SEL = M(L,RS)
1050 T$ = "":IF A > 0 THEN T$ = STR$(A)
1060 T = LEN(T$):IF T > 4 THEN MAX = MAX+T-4
1070 IF A <> 0 AND B <> 0 THEN T$ = T$+"-"
1080 IF B <> 0 THEN T$ = T$+STR$(B)+"/"+STR$(C)
1090 T$ = T$+SP$+LEFT$(BL$,MAX-LEN(T$))
1100 T = A+B/(C-(C = 0))
1110 IF SEL < 10 THEN T$ = T$+SP$+MUNIT$(SEL)
1120 PRINT T$;S$(ABS((T > 1)*(SEL <> 10)));SP$;IG$(L)
1130 NEXT L:PRINT LI$;LI$;DA$:PRINT
1140 PRINT "NUMBER OF SERVINGS: ";NS(RS):PRINT:PRINT
1150 PRINT:PRINT CHR$(4);"PR#0":PRINT:GOSUB 2000
1160 PRINT "PRESS <C> TO CHANGE THE NUMBER OF"
1170 PRINT "SERVINGS, <I> TO INPUT A NEW RECIPE,"
1180 PRINT "OR <Q> TO QUIT.";
1190 GOSUB 4000:IF K$ <> "C" AND K$ <> "I" AND K$ <> "
Q" THEN 1190
1200 IF K$ = "I" THEN HOME:RUN
1210 IF K$ = "C" THEN GOSUB 2000:GOTO 600
```

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HOME HELPER PROGRAM

```
1220 END
2000 HOME:HTAB 12:INVERSE:PRINT "COOKING CALCULATOR"
2010 NORMAL:PRINT:PRINT:RETURN
3000 FF = 0:FOR L = 1 TO PC
3010 IF MID$(T$,L,1) = F$ THEN T = L:L = PC:FF = 1
3020 NEXT L:IF FF = 1 THEN RETURN
3030 T = 0:RETURN
4000 GET K$:K = ASC(K$)
4010 K$ = CHR$(K-32*(K > 96)*(K < 123)):RETURN
5000 GOSUB 4000:IF K$ <> "Y" AND K$ <> "N" THEN 5000
5010 RETURN
6000 PRINT:PRINT "PRESS <SPACE BAR> TO CONTINUE.";
6010 GET K$:IF K$ <> SP$ THEN 6010
6020 RETURN
7000 DATA 2,3,5,7,11,13
8000 DATA TEASPOON,3,TABLESPOON,16,FLUIDOUNCE,8
8010 DATA CUP,2,PINT,2,QUART,4,GALLON,0
8020 DATA AVDP. OUNCE,16,POUND,0,[OTHER],0
```

Commodore 64 & 128 (C 64 mode) w/80-column printer/*Cooking Calculator*

```
10 DIM CUNIT(10),DV(6),M(50,2),NS(2),Q(50,3,2)
20 DIM IG$(50),MUNIT$(10),S$(1)
30 DA$=CHR$(45):SP$=CHR$(32):S$(0)="":S$(1)="S"
40 BL$=SP$:FOR L=2 TO 39:BL$=BL$+SP$:NEXT L
50 LI$=DA$:FOR L=2 TO 39:LI$=LI$+CHR$(45):NEXT L
60 FOR L=1 TO 6:READ DV(L):NEXT L
70 FOR L=1 TO 10:READ MUNIT$(L),CUNIT(L):NEXT L
80 GOSUB 2000:INPUT "RECIPE NAME";RN$
90 T=LEN(RN$):IF T>40 THEN 80
100 LM=INT(40-T)/2:IC=1
110 GOSUB 2000:PRINT TAB(LM);RN$
120 POKE 214,3:PRINT:PRINT LI$
130 POKE 214,4:PRINT:PRINT TAB(13);"INGREDIENT";IC
140 POKE 214,18:PRINT
150 PRINT "TYPE THE QUANTITY USING A HYPHEN AND/OR"
160 PRINT "SLASH IF NEEDED (E.G., 2, 1/2, 3-1/4)"
170 PRINT "AND PRESS <RETURN>. JUST PRESS <RETURN>"
180 PRINT "IF THERE ARE NO MORE INGREDIENTS."
190 POKE 214,6:PRINT:T$=""
200 INPUT "HOW MANY";T$:PC=LEN(T$)
210 IF PC=0 OR VAL(T$)=0 THEN ON ABS(IC=1) GOTO 340:GO
TO 550
220 F$="-":GOSUB 3000:PA=T
230 F$="/":GOSUB 3000:PB=T
240 F$=".":GOSUB 3000:PD=T
250 IF PA>PB OR PB=PC OR PA=1 OR PB=1 OR PD<>0 THEN 34
0
260 IF PA<>0 THEN 290
270 IF PB<>0 THEN A=0:GOTO 300
280 A=VAL(T$):B=0:C=0:GOTO 360
290 A=VAL(LEFT$(T$,PA-1))
300 B=VAL(MID$(T$,PA+1,PB-PA))
310 C=VAL(MID$(T$,PB+1,PC-PB))
320 IF C<1 OR C>999 THEN 340
330 IF B<C AND (B>0 OR C=0) THEN 360
340 POKE 214,6:PRINT
350 FOR L=1 TO 2:PRINT BL$:NEXT L:GOTO 140
360 GOSUB 4000:Q(IC,1,1)=A:Q(IC,2,1)=B
370 Q(IC,3,1)=C:V=A+B/((C-(C=0))):POKE 214,18:PRINT
380 PRINT "PRESS <SPACE BAR> FOR NEXT MEASUREMENT"
390 PRINT "UNIT OR <RETURN> TO ACCEPT."
400 POKE 214,7:PRINT:PRINT "WHAT UNIT?":S=1
410 POKE 214,7:PRINT:PRINT TAB(11);MUNIT$(S);
420 PRINT S$(ABS((V>1)*(S<>10)));LEFT$(BL$,7)
430 GOSUB 5000:IF K<>32 AND K<>13 THEN 430
440 IF K=32 THEN S=S+1:S=S+10*(S=11):GOTO 410
450 M(IC,1)=S:GOSUB 4000:T$=""
460 POKE 214,8:PRINT:INPUT "WHAT INGREDIENT";T$
470 IF T$="" THEN 460
480 IG$(IC)=T$:PRINT LI$
490 PRINT "IS THIS CORRECT? ";:GOSUB 6000
500 PRINT K$:IF K$="N" THEN 110
510 IC=IC+1:IF IC<51 THEN 110
520 PRINT LEFT$(LI$,39)
530 PRINT "THERE IS NO ROOM FOR ANY MORE"
540 PRINT "INGREDIENTS.":GOSUB 7000:GOTO 580
550 GOSUB 4000:POKE 214,8:PRINT:PRINT LI$
```

```
560 PRINT "IS THIS THE LAST INGREDIENT?"
570 GOSUB 6000:IF K$="N" THEN 110
580 IC=IC-1:GOSUB 2000:T$=""
590 INPUT "HOW MANY SERVINGS DOES THIS RECIPE MAKE";T$
600 T=VAL(T$):IF T<1 OR INT(T)<>T THEN 590
610 NS(1)=T:GOSUB 2000
620 PRINT "ORIGINAL RECIPE SERVES";STR$(NS(1));"."
630 PRINT:T$=""
640 INPUT "HOW MANY SERVINGS DO YOU WANT TO MAKE";T$
650 T=VAL(T$):IF T<1 OR INT(T)<>T THEN 640
660 NS(2)=T:MF=NS(2)/NS(1):GOSUB 2000
670 IF MF=1 THEN RS=1:GOTO 1020
680 FOR L=1 TO IC:SEL=M(L,1):A=Q(L,1,1)
690 B=Q(L,2,1):C=Q(L,3,1):IF C=0 THEN C=1
700 B=(A*C+B)*NS(2):C=C*NS(1)
710 A=INT(B/C):B=B-A*C:IF MF<1 THEN 800
720 IF SEL=7 OR SEL>8 THEN 910
730 IF SEL=8 THEN RA=8:RB=8:GOTO 750
740 RA=SEL:RB=6+(SEL<3)
750 FOR R=RA TO RB:FA=CUNIT(SEL)
760 IF A<FA THEN R=RB:GOTO 790
770 T=INT(A/FA):B=B+(A-T*FA)*C:A=T
780 C=C*FA:SEL=SEL+1-(SEL=2)
790 NEXT R:GOTO 910
800 IF A>0 THEN 910
810 IF SEL=1 OR SEL=8 OR SEL=10 THEN 910
820 IF SEL=9 THEN RA=8:RB=8:GOTO 840
830 RA=SEL-1+(SEL=4):RB=1
840 FOR R=RA TO RB STEP -1
850 IF SEL=3 THEN FA=2:SEL=2:GOTO 870
860 SEL=SEL-1+(SEL=4):FA=CUNIT(SEL)
870 B=FA*B:IF B<C THEN 900
880 R=RB:IF B=C THEN A=1:B=0:C=0:GOTO 900
890 A=INT(B/C):B=B-A*C
900 NEXT R
910 IF B<2 THEN 960
920 IF C/B=INT(C/B) THEN C=C/B:B=1:GOTO 960
930 FOR X=1 TO 6:D=DV(X)
940 IF B/D=INT(B/D) AND C/D=INT(C/D) THEN B=B/D:C=C/D:
GOTO 940
950 NEXT X
960 Q(L,1,2)=A:Q(L,2,2)=B:Q(L,3,2)=C:M(L,2)=SEL:NEXT L
970 PRINT "PRINT RECIPE WITH <N>EW OR <O>RIGINAL"
980 PRINT "NUMBER OF SERVINGS? ";
990 GOSUB 5000:RS=ABS((K$="O")+(K$="N")*2)
1000 IF RS=0 THEN 990
1010 PRINT K$:PRINT
1020 PRINT "PRESS ANY KEY WHEN PRINTER IS READY."
1030 GOSUB 5000:OPEN 4,4:CMD 4
1040 PRINT TAB(LM+20);RN$:PRINT LI$;LI$;DA$
1050 FOR L=1 TO IC:MAX=11:A=Q(L,1,RS)
1060 B=Q(L,2,RS):C=Q(L,3,RS):SEL=M(L,RS)
1070 T$="":IF A>0 THEN T$=MID$(STR$(A),2)
1080 T=LEN(T$):IF T>4 THEN MAX=MAX+T-4
1090 IF A<>0 AND B<>0 THEN T$=T$+"-"
1100 IF B<>0 THEN T$=T$+MID$(STR$(B),2)+"/"+MID$(STR$(
C),2)
1110 T$=T$+SP$+LEFT$(BL$,MAX-LEN(T$)):T=A+B/(C-(C=0))
1120 IF SEL<10 THEN T$=T$+SP$+MUNIT$(SEL)
1130 PRINT T$;S$(ABS((T>1)*(SEL<>10)));SP$;IG$(L)
1140 NEXT L:PRINT LI$;LI$;DA$:PRINT
1150 PRINT "NUMBER OF SERVINGS:";NS(RS):PRINT:PRINT
1160 PRINT:PRINT#4:CLOSE 4:PRINT:PRINT:GOSUB 2000
1170 PRINT "PRESS <C> TO CHANGE THE NUMBER OF"
1180 PRINT "SERVINGS, <I> TO INPUT A NEW RECIPE,"
1190 PRINT "OR <Q> TO QUIT."
1200 GOSUB 5000:IF K$<>"C" AND K$<>"I" AND K$<>"Q" THE
N 1200
1210 IF K$="I" THEN RUN
1220 IF K$="C" THEN GOSUB 2000:GOTO 620
1230 END
2000 PRINT CHR$(147);
2010 PRINT TAB(11);CHR$(5);"COOKING CALCULATOR"
2020 PRINT CHR$(154):PRINT:RETURN
3000 FF=0:FOR L=1 TO PC
3010 IF MID$(T$,L,1)=F$ THEN T=L:L=PC:FF=-1
3020 NEXT L:IF FF THEN RETURN
3030 T=0:RETURN
```


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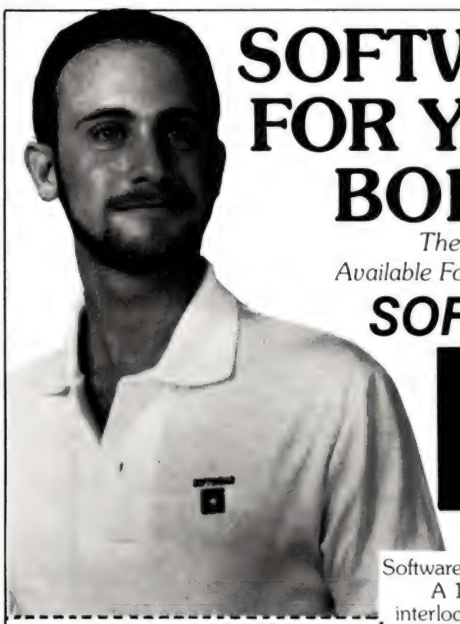

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HOME HELPER PROGRAM

```
4000 POKE 214,18:PRINT:FOR L=1 TO 4
4010 PRINT BL$:NEXT L:RETURN
5000 GET K$:IF K$="" THEN 5000
5010 K=ASC(K$):K$=CHR$(K-32*(K>96)*(K<123)):RETURN
6000 GOSUB 5000:IF K$<>"Y" AND K$<>"N" THEN 6000
6010 RETURN
7000 PRINT:PRINT "PRESS <SPACE BAR> TO CONTINUE."
7010 GOSUB 5000:IF K$<>SP$ THEN 7010
7020 RETURN
8000 DATA 2,3,5,7,11,13
9000 DATA TEASPOON,3,TABLESPOON,16,FLUIDOUNCE,8
9010 DATA CUP,2,PINT,2,QUART,4,GALLON,0
9020 DATA AVDP. OUNCE,16,POUND,0,[OTHER],0
```

IBM PC & compatibles w/80-column printer/ *Cooking Calculator*

This program has been tested and found to work on the following computers and hardware configurations, using the BASIC shown: IBM PC w/Color/Graphics Monitor Adapter or Monochrome/Printer Card, w/Disk BASIC D2.00 or Advanced BASIC A2.00. IBM PCjr w/128K RAM, 80-column monitor, and Cartridge BASIC J1.00. Tandy 1000 w/80-column monitor, w/GW-BASIC 2.02 version 01.01.00. It should also work on many other PC compatibles.

```
10 DIM CUNIT(10),DV(6),M(50,2),NS(2),Q(50,3,2)
20 DIM IG$(50),MUNIT$(10),S$(1)
30 KEY OFF:WIDTH "LPT1:",80
40 BL$=STRING$(160,32):LI$=STRING$(79,45):SP$=CHR$(32)
50 S$(0)="":S$(1)="s":FOR L=1 TO 6:READ DV(L):NEXT L
60 FOR L=1 TO 10:READ MUNIT$(L),CUNIT(L):NEXT L
70 GOSUB 2000:LINE INPUT "Recipe name: ";RN$
80 T=LEN(RN$):IF T>80 THEN 70 ELSE LM=INT(80-T)/2:IC=1
90 GOSUB 2000:PRINT TAB(LM);RN$:LOCATE 5,1:PRINT LI$
100 LOCATE 6,33:PRINT "Ingredient";IC
110 LOCATE 20,1:PRINT "Type the quantity using a hyphe
n and/or slash if needed (examples: 2, 1/2,"
120 PRINT "3-1/4) and press <ENTER>.  Just press <ENTE
R> if there are no more ingredients."
130 LOCATE 8,1:INPUT "How many";T$:PC=LEN(T$)
140 IF PC=0 OR VAL(T$)=0 THEN IF IC=1 THEN 240 ELSE 42
0
150 PA=INSTR(T$,"-"):PB=INSTR(T$,"/")
160 PD=INSTR(T$,".")
170 IF PA>PB OR PB=PC OR PA=1 OR PB=1 OR PD<>0 THEN 24
0
180 IF PA=0 THEN IF PB=0 THEN A=VAL(T$):B=0:C=0:GOTO 2
50 ELSE A=0:GOTO 200
190 A=VAL(LEFT$(T$,PA-1))
200 B=VAL(MID$(T$,PA+1,PB-PA))
210 C=VAL(MID$(T$,PB+1,PC-PB))
220 IF C<1 OR C>999 THEN 240
230 IF B<C AND (B>0 OR C=0) THEN 250
240 SOUND 400,1:LOCATE 8,1:PRINT BL$:GOTO 110
250 LOCATE 20,1:PRINT BL$:Q(IC,1,1)=A:Q(IC,2,1)=B
260 Q(IC,3,1)=C:V=A+B/(C-(C=0)):LOCATE 20,1
270 PRINT "Press <SPACE BAR> for next measurement unit
 or <ENTER> to accept."
280 LOCATE 9,1:PRINT "What unit?":S=1
290 LOCATE 9,12
300 PRINT MUNIT$(S);S$(ABS((V>1)*(S<>10)));STRING$(7,3
2)
310 GOSUB 3000:IF K<>32 AND K<>13 THEN 310
320 IF K=32 THEN S=S MOD 10+1:GOTO 290
330 M(IC,1)=S:LOCATE 20,1:PRINT BL$
340 LOCATE 10,1:LINE INPUT "What ingredient? ";T$
350 IF T$="" THEN 340
360 IG$(IC)=T$:PRINT LI$
370 PRINT "Is this correct? ";:GOSUB 4000
380 PRINT K$:IF K$="N" THEN 90
390 IC=IC+1:IF IC<51 THEN 90 ELSE PRINT LI$
400 PRINT "There is no room for any more ingredients."
410 GOSUB 5000:GOTO 450
420 LOCATE 20,1:PRINT BL$:LOCATE 9,1
430 PRINT LI$:PRINT "Is this the last ingredient?"
440 GOSUB 4000:IF K$="N" THEN 90
450 IC=IC-1:GOSUB 2000
460 INPUT "How many servings does this recipe make";T$
470 T=VAL(T$):IF T<1 OR INT(T)<>T THEN 460
480 NS(1)=T:GOSUB 2000
490 PRINT "Original recipe serves";STR$(NS(1));"."
500 PRINT
```


Infocom introduces four new gam

Infocom,™ the crazy people who brought you "Zork"® and "The Hitchhiker's Guide to the Galaxy,"™ has a habit of coming up with games that add a new dimension to interactive fiction. And the best keeps getting better. Case in point: "Leather Goddesses of Phobos."™ It has a scratch n' sniff card and a 3-d comic book to excite all your senses. Once your interest is piqued, you'll embark on a rowdy romp through the solar system. This hilarious spoof of 1930's pulp science fiction has 3 "naughtiness levels," for the prude to the lewd. "Leather Goddesses" is sure to amuse members of either sex.

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```
510 INPUT "How many servings do you want to make";T$
520 T=VAL(T$):IF T<1 OR INT(T)<>T THEN 510
530 NS(2)=T:MF=NS(2)/NS(1):GOSUB 2000
540 IF MF=1 THEN RS=1:GOTO 860
550 FOR L=1 TO IC:SEL=M(L,1):A=Q(L,1,1)
560 B=Q(L,2,1):C=Q(L,3,1):IF C=0 THEN C=1
570 B=(A*C+B)*NS(2):C=C*NS(1)
580 A=INT(B/C):B=B-A*C:IF MF<1 THEN 660
590 IF SEL=7 OR SEL>8 THEN 760
600 IF SEL=8 THEN RA=8:RB=8 ELSE RA=SEL:RB=6+(SEL<3)
610 FOR R=RA TO RB:FA=CUNIT(SEL)
620 IF A<FA THEN R=RB:GOTO 650
630 T=INT(A/FA):B=B+(A-T*FA)*C:A=T
640 C=C*FA:SEL=SEL+1-(SEL=2)
650 NEXT R:GOTO 760
660 IF A>0 THEN 760
670 IF SEL=1 OR SEL=8 OR SEL=10 THEN 760
680 IF SEL=9 THEN RA=8:RB=8 ELSE RA=SEL-1+(SEL=4):RB=1
690 FOR R=RA TO RB STEP -1
700 IF SEL=3 THEN FA=2:SEL=2:GOTO 720
710 SEL=SEL-1+(SEL=4):FA=CUNIT(SEL)
720 B=FA*B:IF B<C THEN 750
730 R=RB:IF B=C THEN A=1:B=0:C=0:GOTO 750
740 A=INT(B/C):B=B-A*C
750 NEXT R
760 IF B<2 THEN 810
770 IF C/B=INT(C/B) THEN C=C/B:B=1:GOTO 810
780 FOR X=1 TO 6:D=DV(X)
790 IF B/D=INT(B/D) AND C/D=INT(C/D) THEN B=B/D:C=C/D:
GOTO 790
800 NEXT X
810 Q(L,1,2)=A:Q(L,2,2)=B:Q(L,3,2)=C:M(L,2)=SEL:NEXT L
820 PRINT "Print recipe with <N>ew or <O>riginal numbe
r of servings? ";
830 GOSUB 3000:RS=ABS((K$="O")+(K$="N")*2)
840 IF RS=0 THEN 830
850 PRINT K$:PRINT
860 PRINT "Press any key when printer is ready."
870 GOSUB 3000:LPRINT TAB(LM);RN$:LPRINT LI$
880 FOR L=1 TO IC:MAX=11:A=Q(L,1,RS)
890 B=Q(L,2,RS):C=Q(L,3,RS):SEL=M(L,RS)
900 IF A>0 THEN T$=MID$(STR$(A),2) ELSE T$=""
910 T=LEN(T$):IF T>4 THEN MAX=MAX+T-4
920 IF A<>0 AND B<>0 THEN T$=T$+"-"
930 IF B<>0 THEN T$=T$+MID$(STR$(B),2)+"/"+MID$(STR$(C
),2)
940 T$=T$+SP$+STRING$(MAX-LEN(T$),32)
950 T=A+B/(C-(C=0)):IF SEL<10 THEN T$=T$+SP$+MUNIT$(SE
L)
960 LPRINT T$;S$(ABS((T>1)*(SEL<>10)));SP$;IG$(L)
970 NEXT L:LPRINT LI$:LPRINT
980 LPRINT "Number of servings:";NS(RS)
990 LPRINT:LPRINT:LPRINT:PRINT:PRINT:GOSUB 2000
1000 PRINT "Press <C> to change the number of servings
, <I> to input a new recipe,"
1010 PRINT "or <Q> to quit."
1020 GOSUB 3000:IF K$<>"C" AND K$<>"I" AND K$<>"Q" THE
N 1020
1030 IF K$="I" THEN RUN
1040 IF K$="C" THEN GOSUB 2000:GOTO 490 ELSE END
2000 CLS:COLOR 14:PRINT TAB(31);"COOKING CALCULATOR"
2010 COLOR 2:PRINT:PRINT:RETURN
3000 K$=INKEY$:IF K$="" THEN 3000 ELSE K=ASC(K$)
3010 K$=CHR$(K-32*(K>96)*(K<123)):RETURN
4000 GOSUB 3000
4010 IF K$<>"Y" AND K$<>"N" THEN 4000 ELSE RETURN
5000 PRINT:PRINT "Press <SPACE BAR> to continue."
5010 IF INKEY$<>SP$ THEN 5010 ELSE RETURN
6000 DATA 2,3,5,7,11,13
7000 DATA teaspoon,3,tablespoon,16,fluidounce,8
7010 DATA cup,2,pint,2,quart,4,gallon,0
7020 DATA avdp. ounce,16,pound,0,[other],0
```


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CIRCLE READER SERVICE 61

TIPS TO THE TYPIST

Typing BASIC programs from FAMILY COMPUTING is a great way to learn about programming and get some free software to boot! But it's frustrating to type in a long program, only to find it doesn't work as it should. If you're new to typing in programs, here are some tips to help make your first experiences rewarding ones.

BEFORE TYPING IN A PROGRAM

1. Check to see if it will run on your computer under a version of BASIC you have available. Also check to see if special hardware—a disk drive, joysticks, or a printer, for example—is required. Unless the program heading indicates otherwise, you can assume that a program will run under any standard version of BASIC on any standard hardware configuration, with these exceptions:

- "Apple II series" programs will run under Applesoft BASIC on the Apple II plus (w/language card), IIe, and IIc. Programs requiring a disk drive will work equally well under DOS 3.3 or ProDOS.
- Compatibility of IBM BASIC Programs is determined by both the hardware and the version of BASIC used. Our "IBM PC & compatibles" programs are composed on IBM PCs & PC*jr*s and tested under most versions of BASIC available for those machines. They are then tested on a variety of IBM-compatible machines under the versions of BASIC supplied with them. Each IBM PC & compatibles program listing is supplemented by a rundown of the machines and versions of BASIC under which the program is guaranteed to work. Most programs will probably run on many other PC compatibles and under other versions of BASIC.
- TI programs not marked "w/TI Extended BASIC" should be run under standard (console) TI BASIC.

2. If you have a disk drive, prepare ("format" or "initialize") a disk so you can save the program once you're finished typing. Your DOS (Disk Operating System) manual or disk-drive manual will tell you how.

3. Get your version of BASIC fired up and ready. Read the introductory chapters of your BASIC manual for instructions.

WHILE TYPING, KEEP IN MIND THAT . . .

1. BASIC programs consist of "lines," each beginning with a line number (Macintosh BASIC "lines" don't need line numbers), containing letters, numbers, and punctuation marks of various kinds. Each "line" may be composed of several "statements"—instructions that tell the computer to perform various actions—and may continue over several physical lines on the page and/or on your screen.

When typing in a BASIC program, forget considerations of format and get the *content* of what you type to match the *content* of what you see on the printed page. Regardless of how margins may break up a program "line," it hasn't ended until you reach another line number or the end of the program listing. Begin typing with the line number, then continue on, typing every letter, number, space, and punctuation mark in the order it appears, ignoring margins. Where the "line" ends, there will usually be some trailing spaces (which you don't have to type in), followed by the next line number at the left margin of the listing. At this point, all you have to do is press the RETURN or ENTER key to register the "line" in memory, then continue with the next "line."

2. All marks in a program listing—including every letter, number, space, and punctuation mark—*mean* something to your computer. Moreover, even symbols that look very similar to you mean completely different things to the machine. For example, it is important to distinguish between "1" (number one) and "l" (small letter "L"), or "O" (capital letter "O") and "0" (digit zero). Note that zeros are slashed in most program listings to facilitate discrimination.

It's important, therefore, to duplicate every line exactly when typing. Otherwise you can't expect the program to work as it should, or even work at all. Even uppercase versus lowercase is important on certain computers; the words "PRINT" and "print" may mean completely different things.

3. Each computer has its own commands and keys for program "editing," and your user's manual will tell you how to use them. Besides the editing keys, there are two sure-fire ways of correcting errors in a BASIC program line. If you're just typing along and make a mistake, press the backspace-delete key (the back-arrow key on most systems) to rub out the offending character, and then continue typing. Once you've pressed RETURN or ENTER to register the line, mistakes are a little harder to fix. You must use the editing keys or type the line in again from the beginning (including the line number) and press RETURN or ENTER. The new line will replace the old one with the same line number in your computer's memory. This option is a little more work, but foolproof.

AFTER YOU'VE FINISHED . . .

1. Just type RUN and press RETURN or ENTER. If you've typed everything correctly, the program should work as described.

2. Of course, it almost never does, not even for seasoned programmers. Typing in a program and having it run off the bat qualifies as a small miracle. Usually there are one or more mistakes, major or minor, that have slipped past your careful scrutiny and are causing your computer to do unexpected things. Not to worry. Now comes what some people consider the most enjoyable part of the programming process: a procedure called "debugging"—finding and eliminating your mistakes. To review portions of your program on the computer screen, use the LIST command as explained in your BASIC manual. If you have a printer, you might find it more convenient to print out what you've typed (check your manual for the appropriate command). Look over each section of the program carefully, preferably with someone else's help. Make sure you haven't dropped a line or a character, miscounted spaces between a pair of quotes, mistaken a comma for a period, mixed up an "O" and a zero, or (most likely) all of the above. When you find a mistake, retype the offending line from the original listing, including the line number, and press RETURN or ENTER as explained above.

Naturally, mistakes tend to occur more frequently in certain areas of a program than in others. Complicated equations are easy to foul up by dropping or mismatching parentheses or math symbols. Data statements—program lines beginning with the usual number, followed by the word DATA—are another popular trouble spot. Check them carefully. And, of course, remember to SAVE a copy of the corrected program when you're finished.

Good luck!

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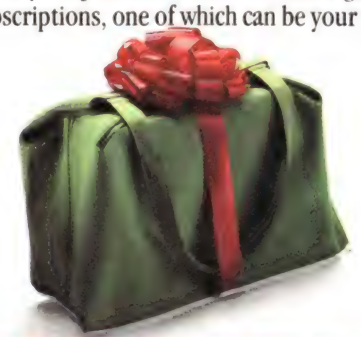

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This Month!!

DR. KURSOR, page 82
GAME STRATEGY, page 84
MICROTONES, page 86
COMPUCOPIA, page 88
CONTEST, page 88

Edited by Bernadette Grey

K-POWER
FOR THE COMPUTER GENERATION

Have a Scream With Frightening Lightning Page 86

Game Designer Chris Gray

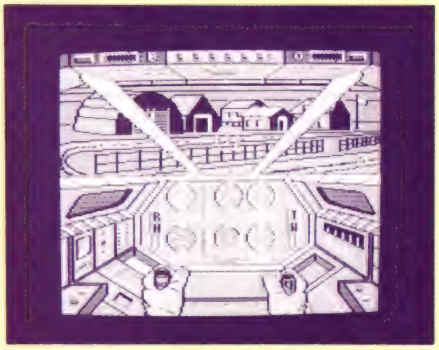
... So Young, So Talented, and So-o-o Successful

It was 12:58 a.m. I had been playing *Boulder Dash* (First Star Software) for two hours and I'd finally made it to the fifth level. Only one Rockford clone remained, and as my tired eyes wandered over to the clock, I goofed. I dug a hole where I shouldn't have. Rocks poured down on my Rockford clone and he exploded into the eight adjacent squares. Argh!! I clenched my teeth in anger, picked up the game box, and looked for the names of *Boulder Dash*'s authors. Chris Gray was one of the game's two designers. His name hit me like a sledgehammer. At that moment, I wanted to tell Gray how mad and frustrated he made me.

Little did I know that less than a year later, I would get the opportunity to talk to Gray—from the K-POWER offices. As it turns out, Gray is just 18 years old, and he's a pretty good guy. In fact, I liked him.

Like many other kids, Gray, who lives in Oakville, Ontario, began to dabble in programming when he was 13 years old. Using an Atari 400, Gray spent many hours plugging away in BASIC, improving his skills, and writing home grown games. What happened to Chris, however, is what most kids only dream of. He became a published game designer. Gray has three games on the market, the ever-popular *Boulder Dash*, *Whirlinurd* (U.S. Gold), and his latest creation, *Infiltrator* (Mindscape). At just 18 years old, Gray is one of the hottest game designers around.

Gray admits that the first game he ever created was simple at best. It had no name and the object was to catch falling bombs. As his programming improved, so did his games. Chris' first marketed game was *Whirlinurd*, an arcade game for the Commodore 64 and Atari, which only sold in Europe. Soon after *Whirlinurd*, he started working with another game designer, Peter Liepa, on an idea which would become *Boulder Dash*. This game deals with a character named Rockford, whose goal in life is to collect diamonds while trying to avoid falling rocks and other obstacles.



Chris Gray (above) is enjoying the success of his hit game, *Infiltrator* (published by Mindscape).

While Gray enjoyed working with Liepa, he *really* wanted to design a "super-game" on his own. So he started working on his latest success story—*Infiltrator*. After 11 months, he emerged with a program that combines his favorite computer game elements—an arcade-type game combined with a well-thought-out plot.

In this adventure, you are Johnny "Jimbo-Baby" McGibbits, ace pilot and all-around nice guy, whose goal is to slip behind enemy lines and carry out one of three missions. To do this, you use an advanced helicopter called a Gizmo. After the helicopter sequence, you are left on foot. From here, you must get past guards and tackle different obstacles in order to reach your final goal.

Chris Gray seems to portray what many people think a freelance game designer should be. He's intelligent, creative, and totally capable of working on his own. Gray stresses that, in order to get your games on the market, you have to be both a good programmer and a creative thinker. Think of ideas that no one else has thought of, said Gray, and push the game industry forward, not backward.

What's next for Chris Gray? That's difficult to say since Chris doesn't seem to know himself. Right now he's enjoying a well-deserved vacation away from the rigors and pressures of being a game designer. He hints about going to college and maybe, depending on the success of *Infiltrator*, making a sequel. But for now, all we can do is envy Gray's success and struggle with his latest work because if Chris knows what's next, he's not telling.—DAMIAN ROSKILL, *18, New York, New York*

DOCTOR KURSOR'S KLINIC

ILLUSTRATION BY SAM VIVIANO

THE KASE OF "STUMP DR. KURSOR"

Way back when, we asked you to bombard Dr. Kursor with your toughest technical questions. We selected three of the hardest questions you asked, and told Dr. Kursor that he *had* to answer them. We figured that one of those questions would be *sure* to stump know-it-all Dr. Kursor. A few months later, Dr. Kursor stumbled into our offices with answers to those questions that appeared in the April issue. But wait!! One of our readers realized that Dr. Kursor had played a nasty trick on us. He had only answered *two* of the "Stump Dr. Kursor" questions. He was supposed to answer *three*!! We handed him his lab coat, another copy of the third question, and a king-size bag of potato chips, and sent him off scratching his head. We didn't see Dr. Kursor for weeks. But he *did* return, unstumped as usual. Here's the third question, along with Dr. Kursor's answer. The author, John Luttrell, won $25 for *almost* stumping the famed Dr. Kursor.

Is there a way to control the filter in a C 64's SID (Sound Interface Device) chip with a joystick? —JOHN LUTTRELL, *28, Westminster, California*

DR. KURSOR: You can control the sound on any music-making computer with a joystick. Check out *Joystick Demo (see Compucopia in the August 1985 issue)* to learn how to read your joystick; then study up on your computer's music commands (and Microtones programs), and you should find it easy.

I wrote *Filtered Turkey*, the program below, to let you experiment with using the joystick (or keyboard) to kick a SID chip's three filters in and out as the music plays.

These filters allow certain frequencies or sounds to "pass" (or to sound) and stop other frequencies. Thus, the overall tone quality is altered.

You can use the same idea to change the sound in more far-out ways. Just decide what kind of effect you want each joystick movement to have.

COMMODORE 64 & 128 (C 64 MODE)/*FILTERED TURKEY*

```
10 DIM D(98),FL(4,3),NF$(4),PH(98),PL(98):TEMPO=30:S=54272
20 BL$=CHR$(32):FOR I=2 TO 7:BL$=BL$+CHR$(32):NEXT I
30 POKE 53281,0:POKE 53280,2:PRINT CHR$(147)
40 PRINT:PRINT "CHANGE FILTERS BY PRESSING KEYS"
50 PRINT "OR USING A JOYSTICK IN PORT #2."
60 POKE 214,8:PRINT:PRINT CHR$(158);
70 PRINT "  (L)OW-PASS  (UP)":PRINT "  (H)IGH-PASS (RIGHT)"
80 PRINT "  (B)AND-PASS (DOWN)":PRINT "  (N)O FILTER (LEFT)"
90 POKE 214,5:PRINT:PRINT CHR$(155);"--> NO FILTER"
100 FOR I=0 TO 23:POKE S+I,0:NEXT I:POKE S+24,7:POKE S+5,68:POKE S+6,132
110 FOR F=1 TO 4:FOR V=1 TO 3:READ FL(F,V):NEXT V,F
120 FOR F=1 TO 4:READ NF$(F):NEXT F
130 FOR I=1 TO 98:READ PH(I),PL(I),D(I):NEXT I:NM=4
140 FOR I=1 TO 98:POKE S+4,33:POKE S,PL(I):POKE S+1,PH(I)
150 J=15-(PEEK(56320) AND 15):GET K$
160 IF K$="L" OR (J AND 1)=1 THEN NM=1:GOTO 200
170 IF K$="H" OR (J AND 8)=8 THEN NM=2:GOTO 200
180 IF K$="B" OR (J AND 2)=2 THEN NM=3:GOTO 200
190 IF K$="N" OR (J AND 4)=4 THEN NM=4
200 POKE 214,5:PRINT:PRINT CHR$(155);"--> ";NF$(NM);BL$
210 FOR V=1 TO 3:POKE S+21+V,FL(NM,V):NEXT V
220 FOR DE=1 TO TEMPO*D(I):NEXT DE:POKE S+4,32:NEXT I:GOTO 140
1000 DATA 63,1,31,128,1,79,64,1,47,0,0,7
2000 DATA LOW-PASS FILTER,HIGH-PASS FILTER,BAND-PASS FILTER,NO FILTER
3000 DATA 14,24,1,15,210,1,16,195,1,15,210,1,16,195,1,18,209,1,16,195,1
3010 DATA 12,143,1,10,143,1,11,48,1,12,143,1,14,24,1,12,143,1,10,143,1
3020 DATA 12,143,2,16,195,1,18,209,1,21,31,1,0,0,1,21,31,1,0,0,1,21,31
3030 DATA 1,18,209,1,16,195,1,18,209,1,21,31,2,18,209,2,18,209,2,21,31
3040 DATA 1,18,209,1,16,195,1,15,210,1,16,195,1,18,209,1,16,195,1,12,143
3050 DATA 1,10,143,1,11,48,1,12,143,1,14,24,1,12,143,1,10,143,1,12,143
3060 DATA 2,16,195,1,18,209,1,21,31,1,25,30,1,0,0,1,28,49,1,25,30,1,21
3070 DATA 31,1,16,195,1,18,209,1,21,31,2,18,209,2,16,195,2,0,0,2,21,31
3080 DATA 1,25,30,2,21,31,1,25,30,2,25,30,2,21,31,1,25,30,2,21,31,1,25
3090 DATA 30,4,22,96,1,28,49,2,22,96,1,28,49,2,28,49,2,22,96,1,28,49,2
3100 DATA 22,96,1,28,49,2,28,49,1,31,165,1,33,135,2,33,135,2,25,30,2,25
3110 DATA 30,2,21,31,2,21,31,2,18,209,2,16,195,1,18,209,1,21,31,1,25,30
3120 DATA 1,0,0,1,28,49,1,25,30,1,21,31,1,16,195,1,18,209,1,21,31,2,18
3130 DATA 209,2,16,195,3,0,0,3
```

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TIPS, TRICKS, AND HINTS

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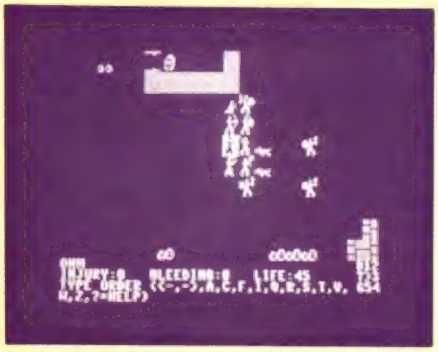

While the fighters cover the front, the others fire bows.

Tips for creating a party of adventurers:

a) Initially create a priest, but don't increase his abilities. Only increase his previous experience. Then spend all of the experience on increasing Karma. This way you will be able to heal any injury and even raise the dead, which will enable all of your characters to survive until they are experienced.

b) In the meantime, have another character serve as a ranger-priest (increase his abilities initially). As soon as the ranger-priest can raise the dead, drop the first priest from the party, as it will be nearly impossible to reasonably increase his abilities. Create another multi-classed priest to fill the place of the dropped character. (New characters receive much more experience from encounters than veterans do, so the new character will soon be up to par with the others.) Make sure you protect the first priest carefully, because if he has to fight, he will be totally ineffective and will soon die.

c) You will need only one thief for the entire party: A fighter-thief is a good choice.

d) Having an extra sorcerer in the party is an invaluable aid. In addition to one pure sorcerer, have a multi-classed one, preferably a ranger-sorcerer. This extra sorcerer is helpful when fighting enemy mages (magic users) because, while one sorcerer can cast offensive spells, the other can dispell the enemy magic. When not fighting enemy mages, the ranger-sorcerer can provide cover support with a bow or cast spells.

e) Make sure that there's at least one fighter in your party who uses each type of weapon (e.g., one uses a thrust type, one a cut type, and one a bash type). You'll need this variety when you start fighting ward-pact demons that are always immune to every type of damage except for one.

Make sure you go to all of the taverns; one of them is vital.

f) Don't have your main fighter types use a missile weapon. If an enemy mage casts a missile protection, these fighters become worse than useless. At the very best, they'll have to change weapons or wait until one of your sorcerers can cast a DISPELL MAGIC; at worst they'll be ineffective for the rest of the combat. Give bows (crossbows have to be loaded, which is a waste of time) to one or two of your multi-classed priests and sorcerers. Let the rest use spears. This way, even if an enemy casts missile protection, these characters will still be able to participate in the fight by casting spells and praying.

When your fighters become experienced and have good protective devices, a shield becomes less valuable. Have some, if not all of them, switch to bigger and more damaging two-handed weapons.

Make sure that you try going into every tavern; one of them is particularly worthwhile to visit.

In combat situations where there are enemy mages, concentrate missile fire on them and have a fighter-thief try to hide in the shadows and sneak up to the mages. If you don't have a fighter-thief, it's usually a good idea to have one of your fighters charge the mages before the other enemies can block your way.

These are the skills of the first priest, who will be discarded.

Since dungeons are particularly difficult to negotiate, it's easier to have just one active character. This way you'll be able to move around and explore quickly without being bogged down by others. When combat occurs, use the quick-combat option so that the whole party, no matter where you left them in the dungeon, can participate. However, this method becomes dangerous if you ever end up encountering ward-pact demons, which are almost impossible to beat in quick-combat. And if you try regular combat, the rest of the party will be stuck where you left them.

The dungeon reset feature can work to your advantage. For example, after you get the golem staff in the mansion for the first time, reset it and get the golem staff again. If two or even three of your fighters possess this weapon, you will never have to fear golems again. (Make sure that you give these fighters some skill in mace so that they can use it effectively.) —DAVID LANGENDOEN, *18, Charlottesville, Virginia*; CHRIS VAN KIRK, *18, New York, New York*

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ATARI 400/800, 600/800XL, & 130XE/ *FRIGHTENING LIGHTNING*

```
10 DIM L$(680),SP$(1):SP$=CHR$(32)
20 BG=709:FG=710:BO=712:POKE BG,202:POKE FG,148
30 POKE BO,0:POKE 82,0:POKE 752,1:PRINT CHR$(125)
40 POSITION 14,0:PRINT "STAND BY ..."
50 L$(1)=SP$:L$(680)=SP$:L$(2)=L$
60 X=1:Y=0:FOR L=1 TO 79:READ Z
70 IF Z<=X THEN Y=Y+40
80 X=Z:L$(X+Y,X+Y)=CHR$(160)
90 NEXT L:POKE BG,0:POKE FG,0
100 PRINT CHR$(125);:FOR D=1 TO RND(1)*600+600
110 NEXT D:POSITION 0,0:PRINT L$
120 FOR L=1 TO RND(1)*50+50
130 POKE BG,15:POKE FG,0:POKE BO,0
140 SOUND 0,RND(1)*50+10,8,8
150 POKE BG,0:POKE FG,15:POKE BO,15:NEXT L
160 POKE FG,0:POKE BO,0
170 F=RND(1)*50+10:FOR I=10 TO 0 STEP -0.15
180 SOUND 0,F,8,I:NEXT I:GOTO 100
1000 DATA 2,20,26,3,18,19,27,4,14,15,16,17,26
1010 DATA 28,29,30,31,5,13,25,29,32,33,5,11,12
1020 DATA 14,25,30,34,35,6,10,15,30,31,36,37,7
1030 DATA 9,16,17,18,19,30,32,7,8,29,33,7,28
1040 DATA 34,8,28,35,8,27,35,9,36,10,11,12,37,9
1050 DATA 13,37,8,14,15,16,17,37,7,38,39,6,40
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COMMODORE 64 & 128 (C 64 MODE)/ *FRIGHTENING LIGHTNING*

```
10 DIM L$(17):S=54272:BG=53281:BO=53280
20 SP$=CHR$(32):CH$=CHR$(18)+SP$+CHR$(146)
30 POKE BG,246:POKE BO,254
40 FOR I=0 TO 24:POKE S+I,0:NEXT I
50 PRINT CHR$(147);TAB(14);CHR$(5);"STAND BY ..."
60 Z=2:FOR Y=1 TO 17:L$(Y)="":FOR X=1 TO 40
70 IF Z=X THEN L$(Y)=L$(Y)+CH$:READ Z:GOTO 90
80 L$(Y)=L$(Y)+SP$
90 NEXT X,Y:POKE S+5,1:POKE S+6,204:POKE S+24,15
100 POKE BG,0:POKE BO,0
110 PRINT CHR$(147);
120 FOR D=1 TO RND(1)*700+700:NEXT D
130 POKE S+4,129:POKE S,104:POKE S+1,RND(1)*9+6
140 FOR Y=1 TO 17:PRINT L$(Y);:NEXT Y
150 FOR L=1 TO RND(1)*5+15:POKE S+1,RND(1)*9+2
160 POKE BG,RND(1)*2:POKE BO,RND(1)*2
170 NEXT L:POKE BG,0:POKE BO,0
180 FOR D=1 TO 30:NEXT D:POKE S+4,128:GOTO 110
1000 DATA 20,26,3,18,19,27,4,14,15,16,17,26
1010 DATA 28,29,30,31,5,13,25,29,32,33,5,11,12
1020 DATA 14,25,30,34,35,6,10,15,30,31,36,37,7
1030 DATA 9,16,17,18,19,30,32,7,8,29,33,7,28
1040 DATA 34,8,28,35,8,27,35,9,36,10,11,12,37,9
1050 DATA 13,37,8,14,15,16,17,37,7,38,39,6,40,0
```

IBM PC*jr* & COMPATIBLES/ *FRIGHTENING LIGHTNING*

This program has been tested and found to work on the following computers, using the BASICs shown: IBM PCjr w/Cartridge BASIC J1.00. Tandy 1000 w/GW-BASIC 2.02 version 01.01.00.

```
10 DIM L$(17):SCREEN ,,0,0:WIDTH 40
20 LOCATE ,,0:KEY OFF:SOUND ON
30 COLOR 15,0,0:CLS:PRINT TAB(14);"STAND BY ..."
40 X=1:Y=1:L$(1)=STRING$(40,32):FOR L=1 TO 79
50 READ Z:IF Z<=X THEN Y=Y+1:L$(Y)=STRING$(40,32)
60 X=Z:MID$(L$(Y),X,1)=CHR$(219):NEXT L
70 COLOR 15,0:CLS
80 FOR D=1 TO RND(1)*1000+1000:NEXT D
90 FOR Y=1 TO 17:PRINT L$(Y);:NEXT Y
100 FOR L=1 TO RND*5+15:NS=INT(RND*3)+4
110 VOL=INT(RND*3)+13:DUR=INT(RND*5)+10
120 NOISE NS,VOL,DUR:COLOR ,,15:COLOR ,,0
130 SCREEN ,,1,1:COLOR ,7:CLS:FOR D=1 TO 10:NEXT D
140 COLOR ,0:CLS:SCREEN ,,0,0:NEXT L
150 FOR D=1 TO 50:NEXT D:NOISE 4,0,0:GOTO 70
1000 DATA 2,20,26,3,18,19,27,4,14,15,16,17,26
1010 DATA 28,29,30,31,5,13,25,29,32,33,5,11,12
1020 DATA 14,25,30,34,35,6,10,15,30,31,36,37,7
1030 DATA 9,16,17,18,19,30,32,7,8,29,33,7,28
1040 DATA 34,8,28,35,8,27,35,9,36,10,11,12,37,9
1050 DATA 13,37,8,14,15,16,17,37,7,38,39,6,40
```

TI-99/4A W/EXTENDED BASIC/ *FRIGHTENING LIGHTNING*

Will run under standard TI BASIC if each statement is placed on a separate line.

```
10 CALL CHAR(128,"FFFFFFFFFFFFFFFF")
20 CALL CLEAR :: CALL SCREEN(2)
30 X=0 :: Y=1 :: FOR L=1 TO 83 :: READ Z
40 IF Z>X THEN 60
50 Y=Y+1
60 X=Z :: CALL HCHAR(Y,X,128):: NEXT L
70 CALL COLOR(13,16,2):: FOR L=1 TO 10
80 CALL SOUND(RND*750+500,-(RND*3+5),RND*30)
90 CALL SCREEN(INT(RND*2)*14+2)
100 FOR DE=1 TO 20 :: NEXT DE
110 CALL SCREEN(2):: NEXT L :: CALL COLOR(13,2,16)
120 FOR DE=1 TO RND*1000+1 :: NEXT DE :: GOTO 70
1000 DATA 2,14,27,2,3,15,26,3,4,5,6,7,16,25,2,5,8,9,17
1010 DATA 18,23,24,26,27,1,2,6,10,11,12,13,18,19,22
1020 DATA 28,29,1,7,8,14,20,21,30,31,1,9,14,15,21,2,9
1030 DATA 22,8,23,7,23,24,7,24,25,26,27,6,7,24,28,5
1040 DATA 8,9,23,29,5,10,21,22,30,4,11,12,20,21,30,31
```

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SHORT PROGRAMS BY STEVEN C. M. CHEN

MOUSE IN THE MAZE

There isn't a *bug* in this program, but there *is* a mouse. And this hungry little creature won't stop running until it tracks down a tasty chunk of swiss cheese. Just type in this program, type RUN, and watch the little rodent go!

APPLE II SERIES/*MOUSE IN THE MAZE*

```
10 DIM MP(35,15),DP(4),XR(4),YR(4)
20 MS$ = "M":SP$ = CHR$(32)
30 HOME:FOR L = 1 TO 4:READ XR(L),YR(L):NEXT L
40 FOR Y = 1 TO 15:T$ = ""
50 FOR L = 1 TO 5:READ A$:T$ = T$+A$:NEXT L
60 FOR X = 1 TO 35:T = -(MID$(T$,X,1) = "W")
70 IF T THEN INVERSE:PRINT SP$;:NORMAL:GOTO 90
80 PRINT SP$;
90 MP(X,Y) = T:NEXT X:PRINT:NEXT Y:VTAB 2:PRINT "S"
100 X = INT(RND(1)*33)+2:Y = INT(RND(1)*13)+2
110 IF (X < 17 AND Y < 7) OR MP(X,Y) = -1 THEN 100
120 VTAB Y:HTAB X:PRINT "C":CX = 2:CY = 2
130 VTAB CY:HTAB CX:PRINT MS$
140 T = MP(CX,CY):IF T = 0 OR T = 5 THEN 170
150 R = T-2*((T > 2)-(T < 3)):MP(CX,CY) = -1
160 FOR D = 1 TO 90:NEXT D:GOTO 270
170 C = 0:PV = 0:FOR L = 1 TO 4
180 N = MP(CX+XR(L),CY+YR(L))
190 IF N > 0 THEN PV = L:GOTO 210
200 IF N <> -1 THEN C = C+1:DP(C) = L
210 NEXT L:ON SGN(C-1)+2 GOTO 220,240,230
220 R = PV:MP(CX,CY) = -1:GOTO 270
230 R = DP(INT(RND(1)*C+1)):MP(CX,CY) = 5:GOTO 270
240 IF MP(CX-XR(R),CY-YR(R)) = -1 THEN MP(CX,CY) = PV-
2*((PV > 2)-(PV < 3)):GOTO 260
250 MP(CX,CY) = R
260 R = DP(1)
270 VTAB CY:HTAB CX:PRINT SP$:CX = CX+XR(R)
280 CY = CY+YR(R):IF CX <> X OR CY <> Y THEN 130
290 FOR L = 1 TO RND(1)*9+12:VTAB CY:HTAB CX:PRINT "C"
300 FOR D = 1 TO 100:NEXT D:VTAB CY:HTAB CX:PRINT MS$
310 FOR D = 1 TO 100:NEXT D,L:RESTORE:GOTO 30
1000 DATA 0,-1,1,0,0,1,-1,0
2000 DATA WWWWWWW,WWWWWWW,WWWWWWW,WWWWWWW,WWWWWWW
2010 DATA WPPPPPP,PPPPPPP,PPPPPPP,PWPPPWP,PPPPWPW
2020 DATA WPWWWWW,WWWWWWW,WWWPWWW,PWPWPWP,WWWPWPW
2030 DATA WPWPPPP,PWPPPPP,WPPPWPW,PPPWPWP,WPPPWPW
2040 DATA WPWPWWW,PWWWWWP,WPWWWPW,PWWWPWP,WWWWWPW
2050 DATA WPPPPPW,PPPPPPP,WPWPPPW,PWPPPPP,PPPPPPW
2060 DATA WWWWWWW,WWWWWWW,WPWPWWW,PWPWWWW,WWWWWPW
2070 DATA WPPPWPP,PPPPPPP,PPWPPPW,PWPPPWP,PPPPPPW
2080 DATA WPWWWPW,WWWWWWW,WWWWWPW,PWWWPWP,WWWWWPW
2090 DATA WPPPWPW,PPPPPPP,PPWPWPW,PWPPPWP,WPPPWPW
2100 DATA WPWPWPW,PWWWWWW,WPWPWPW,WWPWPWW,WPWPWPW
2110 DATA WPWPPPP,PWPPPPP,WPPPPPW,PPPWPPP,PPWPWPW
2120 DATA WPWWWWW,WWPWWWW,WWWWWWW,PWWWWWW,WWWPWWW
2130 DATA WPPPPPP,PWPPPPP,PPPPPPP,PPPPPPP,PPWPPPW
2140 DATA WWWWWWW,WWWWWWW,WWWWWWW,WWWWWWW,WWWWWWW
```

ATARI 400/800, 600/800XL, & 130XE/*MOUSE IN THE MAZE*

```
10 DIM MP(35,15),DP(4),XR(4),YR(4),A$(7),MS$(1),T$(35)
20 POKE 82,1:POKE 752,1:MS$=CHR$(20)
30 PRINT CHR$(125):FOR L=1 TO 4:READ X:XR(L)=X
40 READ X:YR(L)=X:NEXT L:FOR Y=1 TO 15
50 T$="":FOR L=1 TO 5:READ A$:T$(L*7-6)=A$:NEXT L
60 FOR X=1 TO 35:T=-(T$(X,X)="W")
70 PRINT CHR$((T=-1)*128+32);
80 MP(X,Y)=T:NEXT X:PRINT :NEXT Y
90 POSITION 1,2:PRINT "S"
100 X=INT(RND(0)*33)+2:Y=INT(RND(0)*13)+2
110 IF (X<17 AND Y<7) OR MP(X,Y)=-1 THEN 100
120 POSITION X,Y:PRINT "C":CX=2:CY=2
130 POSITION CX,CY:PRINT MS$
140 T=MP(CX,CY):IF T=0 OR T=5 THEN 170
150 R=T-2*((T>2)-(T<3)):MP(CX,CY)=-1
160 FOR D=1 TO 50:NEXT D:GOTO 260
170 C=0:PV=0:FOR L=1 TO 4
180 N=MP(CX+XR(L),CY+YR(L)):IF N>0 THEN PV=L:GOTO 200
190 IF N<>-1 THEN C=C+1:DP(C)=L
200 NEXT L:ON SGN(C-1)+2 GOTO 210,230,220
210 R=PV:MP(CX,CY)=-1:GOTO 260
220 R=DP(INT(RND(0)*C+1)):MP(CX,CY)=5:GOTO 260
230 IF MP(CX-XR(R),CY-YR(R))=-1 THEN MP(CX,CY)=PV-2*((
PV>2)-(PV<3)):GOTO 250
240 MP(CX,CY)=R
250 R=DP(1)
260 POSITION CX,CY:PRINT CHR$(32):CX=CX+XR(R)
270 CY=CY+YR(R):IF CX<>X OR CY<>Y THEN 130
280 FOR L=1 TO RND(0)*9+12:POSITION CX,CY:PRINT "C"
290 FOR D=1 TO 60:NEXT D:POSITION CX,CY:PRINT MS$
300 FOR D=1 TO 60:NEXT D:NEXT L:RESTORE :GOTO 30
```

After you have typed in the above lines, add the DATA statements (lines 1000-2140) from the Apple version.

MY FAVORITE CONTEST

ILLUSTRATION BY J.D. KING

Everyone has favorites. You know, favorite friends, favorite classes, favorite foods, favorite colors. We bet you even have a favorite computer game. We asked the SPECIAL Ks to name their favorite game, but they refused; they say that's like asking a food critic to name his or her favorite restaurant. Well, la-de-da!! Aren't *they* getting high and mighty! We bet *you'll* tell us what *your* favorite game is and why. Fill out the contest response, below, and send it to "My Favorite Contest," c/o K-POWER, 730 Broadway, New York, NY 10003 before October 24. We'll pick three of our *favorite* contest responses and provide the winners with $10 each.

Name_____ Birthdate _____

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What computer(s) do you own (make and model)? _____

What's your favorite computer game? _____

Why? _____

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NEW HARDWARE & ACCESSORIES

COMPUTERS

ComputerLand Business Computing System

MANUFACTURER: ComputerLand
ADDRESS: 30985 Santana St., Hayward, CA 94544; (415) 487-5000
PRICE: $1,495 (XT version); $2,895 (AT version)

ComputerLand, one of the world's largest retailers of personal computers, has brought out a "private label" computer called the ComputerLand Business Computing System (BCS). It will be sold through 600 of ComputerLand's 800 worldwide retail outlets. The computer system can assume either the IBM XT or the IBM AT configuration.

The basic system includes a system unit and keyboard. ComputerLand dealers will install either the XT or the AT plug-in board at your choosing. When faster processors become available, ComputerLand says users will be able to plug in new boards.

The standard BCS is sold with 256K and eight expansion slots. But disk drives and monitors are sold separately so that the basic system can be customized.

MODEMS

TravelComm 1200 Portable Modem

MANUFACTURER: TouchBase Design
ADDRESS: Technigroup (marketing company), 16 Green Acre Lane, Northport, NY 11768; (516) 261-0423
PRICE: $299

Many portable computers have built-in modems. But then again, many don't. And those that do often have 300-baud modems, whose relatively slow speed can be a drawback for heavy communications use.

The TravelComm 1200 solves both problems. It's a battery-operated 1200-baud modem that fits in a shirt pocket. Take your portable out of your briefcase, take the modem out of your shirt pocket, and connect them via the serial port. You're off to the races with a 1200-baud modem.

Since it has its own battery power (it runs 20 to 30 hours), the modem won't drain your portable's batteries. The modem is not Hayes compatible, but Technigroup says it will work with any computer that can go into a local terminal mode. (It was made for the Tandy 100 and NEC 8201.) A new Hayes-compatible version will be introduced this fall.

ProAPP 10 & 20 Hard-Disk Drive

MANUFACTURER: ProAPP Systems Inc.
ADDRESS: 1475 S. Bascom Ave., Suite 101, Campbell, CA 95008; (408) 559-3552; for orders, (800) 424-2425
PRICE: $795 (ProAPP 10); $995 (ProAPP 20)

The ProAPP hard-disk drive system, available in 10- and 20-megabyte models, connects to an Apple IIe/IIc, IBM, or a Macintosh. If you own or use two computers, you can use one hard drive; if you upgrade from one to another, you don't have to lose your initial investment.

On a hard-disk drive, you can store both your programs and your data files, saving you from handling floppy disks day in and day out. Hard drives store the equivalent of about 500 double-spaced pages (10 megabytes) or 1,000 pages (20 megabytes). Also, hard drives load and save data faster than floppy drives.

The ProAPP connects to the floppy-disk drive ports on the Apple IIe and IIc and 512K Mac, the SCSI port on the Mac Plus, and the SCSI host adaptor board on the IBM. The hard drive can accommodate the various Apple operating systems, and thus provides a means for transferring text files between an Apple II and a Macintosh.

PRINTERS

Star NL-10 Printer

MANUFACTURER: Star Micronics, Inc.
ADDRESS: #3 Oldfield, Irvine, CA 92714; (714) 768-4340
PRICE: $319

No matter which computer you own, the NL-10 dot matrix printer from Star Micronics will work with it. A special interface cartridge (about $60) that attaches to the back of the printer makes it compatible with any computer's interface, whether parallel or serial. The NL-10 offers a top speed of 120 characters per second (cps) in draft mode and 30 cps in near letter quality, along with seven graphics modes with increasing resolution up to 216 x 240 dots per square inch.

You can choose from several print styles—including pica, elite, condensed, and boldface—by pressing switches on the printer's control panel or by sending commands through your software. Other features let you print in italics, superscript, subscript, and proportional spacing.

The NL-10 works with easily installed "endless" ribbon cartridges, which means that the inked ribbon inside is recycled automatically. You can use single sheets with the printer's friction feed or fanfold paper with the tractor feed. The 180-page manual is complete and easy to comprehend, and a one-year warranty is offered.

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NEW HARDWARE & ACCESSORIES

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MANUFACTURER: Omnitronix, Inc.
ADDRESS: P.O. Box 43, Mercer Island, WA 98040; (206) 236-2983
PRICE: $50

The Deluxe RS-232 Interface for Commodore allows you to hook up peripherals such as modems, printers, or most other serial-interfaced devices to any C 64, C 128, Plus 4, or VIC-20 computer. The unit plugs into the User I/O port, and it comes complete with a three-foot cable—so there's nothing else to buy. Easy-to-operate switches on the cover of the interface let you set the device for compatibility with either a printer or a modem. Also included are a complete instruction manual and a terminal program for your modem written in BASIC.

Technalock

MANUFACTURER: Business Security Systems
ADDRESS: 512 S. Hanley, St. Louis, MO 63105; (314) 962-4446
PRICE: $25

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SOFTWARE GUIDE

Welcome to FAMILY COMPUTING's Software Guide, the most comprehensive listing available of two dozen of the newest, most noteworthy, and/or best programs on the market. Our reviewers include families from all over the country who have judged the software according to the following criteria: long-term benefits and applications, adaptability, and advantages of using a computer for a given task. Programs have been evaluated and rated for their performance in each of the categories listed below. More detailed reviews follow the chart. Unless otherwise noted, all programs are in disk format, and minimum memory requirements are 48K for Apple II series, 48K for Atari, 128K for IBM PC/PC*jr* or compatibles, and 128K for Macintosh. "Atari" alone denotes the 800/XL/XE series. "C 64/128" means the software will run on both a C 64 and a C 128 computer in C-64 mode; "C 128" alone means the software will run only on that machine.

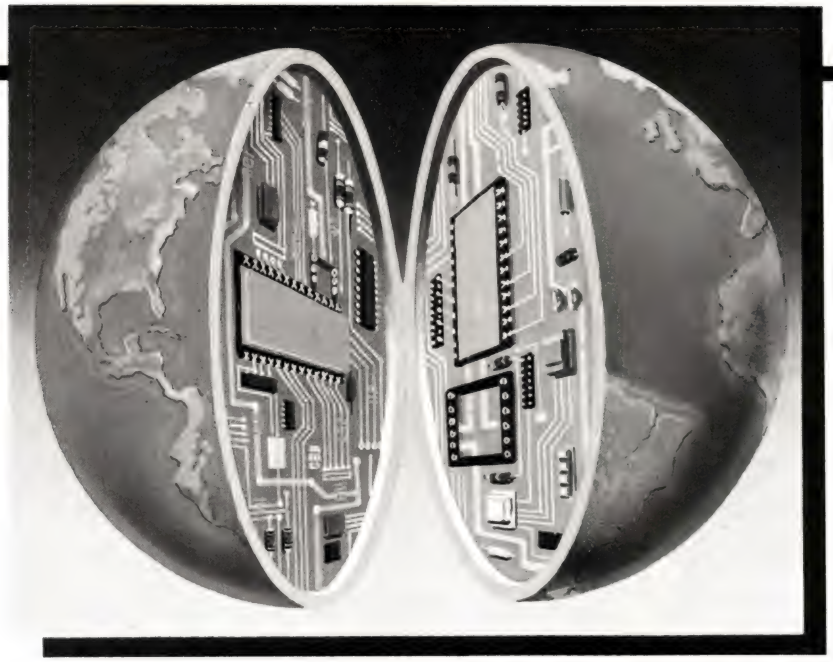
Here's a rundown of the rating categories and what they mean: **O** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions and literature that accompany a program. **EH** = Error-handling, the software's capacity to accommodate errors made by the user—an especially important consideration with software for younger users. **PS** = Play system (in the games reviews), the quality of the game design and the game's playability. **GQ** = Graphics quality, also evaluated in light of each particular brand's graphics capabilities. **EU** = Ease of use after the initial learning period, which varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

EDUCATION/FUN LEARNING

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	EH	GQ	EU	V
MICROZINE, VOL. 14 Scholastic Software 730 Broadway New York, NY 10003 (212) 505-3501 $40 ©1986	Solve a mystery caper (whose clues change each time you play). Or create an eight-panel comic strip. If you enjoy crossword puzzles, make your own with "Puzzler." Lots of fun, but my kids felt they learned more in previous volumes. —MORRIS	Apple. Color monitor recommended.	60-day warranty. $10 for 10 months thereafter.	★★★	★★★★	★★★	★★★	E	★★★
THE MUSIC STUDIO Activision 2350 Bayshore Frontage Rd. Mountain View, CA 94043 (415) 960-0410 $35–$60 ©1986	Billed as a "music composition and programming tool," *The Music Studio* delivers enough features for a musician, yet is simple enough for a 10-year-old. Works with icons and pull-down menus.† —ELTGROTH	Reviewed on IBM PC*jr*. Also for Amiga, Atari 520ST, C 64/128, Tandy 1000. Joystick or mouse.	90-day warranty. $7.50 thereafter.	★★★★	★★★★	★★★	★★★	E	★★★★
PIPELINE Learning Technologies, Inc. 4255 LBJ Freeway, #131 Dallas, TX 75244 (214) 991-4958 $25 ©1985	Place eight different pieces of pipe on-screen to direct the flow of water to where it's needed. In this uncluttered logic game, the play's easy, but winning's not. With three levels and a race-the-clock mode. For ages 8+. —SUMMERS	Reviewed on Apple. Also for C 64/128. Color monitor recommended.	Unlimited warranty.	★★★	★★	★★★	★★	A	★★★
TICKET TO PARIS Blue Lion Software P.O. Box 650 Belmont, MA 02178 (617) 489-2477 $30–$40 ©1986	Simulate a journey to the "City of Lights." Explore shops, museums, and bistros, learning French as you go. Adds cultural enrichment that's too often missing from beginning language lessons.† —SUMMERS	Reviewed on IBM PC/ PC*jr*.* Also for 128K Apple IIe/IIc, C 64/128. Color graphics card (IBM).	90-day warranty. $7.50 thereafter.	★★★★	★★★	★★★★	★★★	E	★★★
WHOLE BRAIN SPELLING subLOGIC 713 Edgebrook Drive Champaign, IL 61820 (217) 359-8482 $30–$35 ©1985	Learning to spell usually means memorization and drill, but many good spellers learn by visualizing words instead. Both methods are used here. Best for the self-motivated. For ages 12+. —SUMMERS	Reviewed on Apple. Also for C 64/128. Color monitor recommended.	6-month warranty. $5 thereafter. $10 for backup.	★★★	★★★	★★★★	★★	E	★★

RATINGS KEY **O** Overall performance: **D** Documentation: **EH** Error-handling: **GQ** Graphics quality: **EU** Ease of use: **V** Value for money: ★ Poor: ★★ Average: ★★★ Good: ★★★★ Excellent: N/A Not applicable: E Easy: A Average: D Difficult: † Longer review follows chart.

*Titles listed for the IBM PC/PC*jr* will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.



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CIRCLE READER SERVICE 8

HOME BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	EH	GQ	EU	V
AI:TYPIST AIRUS Inc. 10200 S.W. Nimbus Ave., Suite G5 Portland, OR 97223 (503) 620-7000 $100 ©1985	A word processor with a special talent—checking your writing for misspellings and typos as you work. Otherwise, it's a good, straightforward writing tool for home or simple office use. —SUMMERS	256K IBM PC/PC*jr*.*	60-day warranty. User makes backup. 15-day money-back guarantee.	★ ★ ★	★ ★	★ ★ ★	N/A	E	★ ★ ★
DELUXEPAINT Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 $100 ©1985	Showcase your Amiga's graphic genius with this icon-based drawing program. One unique feature lets you make any on-screen image into a brush for "painting." But the manual fails to explain some of the powerful commands well.† —POWELL	Amiga. 512K recommended.	90-day warranty. $7.50 thereafter. $20 for backup.	★ ★ ★ ★	★ ★	★ ★ ★	★ ★ ★ ★	E	★ ★ ★
DR. HALO II IMSI 1299 Fourth St. San Rafael, CA 94901 (415) 454-7101 $140 ©1985	Create full-page images (and add text from your word processor's files) with this professional-level graphics package. But problems may occur if you don't follow instructions carefully, since error-handling is poor. —SUMMERS	256K IBM PC.* Color graphics card, 2nd drive. Joystick, mouse, or touchpad recommended.	30-day warranty. User makes backup.	★ ★ ★	★ ★	★	★ ★ ★ ★	A	★ ★
EASY 3D Enabling Technologies, Inc. 600 S. Dearborn St., #1304 Chicago, IL 60605 (312) 427-0386 $149 ©1985	Here's computerized drawing with a difference: not just two, but three dimensions. For example, you can look inside an on-screen cup in addition to viewing all its sides. Fun, too.† —AKER	512K Macintosh.	Unlimited warranty. User makes backup.	★ ★ ★ ★	★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	A	★ ★ ★
MOUSE WORD Version Soft, distributed by Int'l Solutions 910 W. Maude Ave. Sunnyvale, CA 94086 (408) 773-0443 $130 ©1985	Intelligent program design makes this mouse-controlled word processor both sophisticated and simple. Includes pull-down menus for printing commands and a tele-communications mode for going on-line. —MORGENSTERN	128K Apple IIe/IIc. Mouse. Enhanced IIe recommended.	90-day warranty. Free backup when user sends in warranty card.	★ ★ ★	★ ★ ★	★ ★	N/A	E	★ ★ ★
PROFILER 2.1 PM Software 17610 Beach Blvd., No. 29 Huntington Beach, CA 92647 (714) 841-7400 $100 ©1985	As a basic data base with few frills, *ProFILER* does a good job helping you organize information. Each record can hold up to 250 categories, and each floppy can store up to 1,500 records. —MORRIS	64K Apple. Extended 80-column card, 2nd drive recommended.	6-month warranty. User makes backup.	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★
SWIFTCALC 128 Timeworks, Inc. 444 Lake Cook Road Deerfield, IL 60015 (312) 948-9200 $70 ©1983, 1985	You get a lot to like with the C 128 version of the *Swiftcalc* electronic spreadsheet, including pull-down menus and a utility that lets you print spreadsheets horizontally.† —BRADLEY	C 128.	90-day warranty. $7.70 for backup.	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★	E	★ ★ ★ ★
WILL PLANNER Noetic Technologies P.O. Box 3085 Englewood, CO 80155 (303) 770-2380 $84 (copy-protected); $133 (not protected) ©1985	Purpose? Introduces basic concepts of planning your estate, and then helps you create a will and a trust tailored to your needs. Results? Not trustworthy, since the program accepts manifestly incorrect information with no attempt at error-handling. See a lawyer. —MORRIS	IBM PC.* Printer. 2nd drive recommended.	90-day warranty. User makes backup with non-protected version.	★ ★	★	★ ★	N/A	A	★
ZOOMRACKS Quickview Systems 146 Main St., #404 Los Altos, CA 94022 (415) 965-0327 $80 ©1985, 1986	A unique approach to data bases, *Zoomracks* replaces conventional fields and files with familiar-looking index cards and file racks. It's flexible for entering data, but it's hurt by clumsy commands. ST version doesn't use GEM. —STERN	Reviewed on Atari 520ST. Also for 256K IBM PC* (512K recommended). TOS in ROM (Atari), 2 drives (IBM).	90-day warranty. User makes backup.	★ ★	★ ★	★ ★	N/A	D	★ ★

RATINGS KEY **O** Overall performance; **D** Documentation; **EH** Error-handling; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; ★ Poor; ★★ Average; ★★★ Good; ★★★★ Excellent; N/A Not applicable; E Easy; A Average; D Difficult; † Longer review follows chart.

*Titles listed for the IBM PC/PC*jr* will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

ENTERTAINMENT REVIEWS BY JAMES DELSON

Title Publisher Price	Brief description	Hardware/ Equipment required	Backup policy	Ratings O	D	PS	GQ	EU	V
BOP'N WRESTLE Mindscape, Inc. 3444 Dundee Road Northbrook, IL 60062 (312) 480-7667 $30 ©1986	Tremendously entertaining wrestling simulation combines arcade and strategy skills into a highly playable package. Great sound effects and colorful animation have produced a winner for ages 8+.	C 64/128. Joystick(s).	90-day warranty.	★★★★	★★	★★★	★★	A	★★★★
FEATHERS & SPACE PBI Software 1111 Triton Drive Foster City, CA 94404 (415) 349-8765 $35 ©1986	For Macintosh owners who seek a classic arcade-style game, this simple but straightforward shoot-em-up is perfect. Excellent graphics make this game fun for beginners and kids. Ages 6+.	Macintosh.	90-day warranty. $5 thereafter.	★★	★★	★★	★★★	E	★★
FIVE-A-SIDE SOCCER Mastertronic Int'l. 7311B Grove Road Frederick, MD 21701 (301) 695-8877 $10 ©1986	Challenging, yet easy-to-learn, this one- or two-person soccer game is a delight for all levels of experience. The voice of an "announcer" is synthesized, which adds to the fun. Ages 8+.	C 64/128. Joystick(s).	30-day warranty.	★★★	★	★★	★★	E	★★★★
FOOTBALL subLOGIC 713 Edgebrook Drive Champaign, IL 61820 (217) 359-8482 $40 ©1986	With remarkable details, this menu-driven football simulation will please sports fans and convert doubters. Joystick controls whole game for fast play. For ages 10+.	C 64/128. Joystick(s).	6-month warranty. $5 thereafter. $10 for backup.	★★★★	★★★	★★★	★★	A	★★★
THE LORDS OF MIDNIGHT Mindscape, Inc. (*See above for address and phone*) $20 ©1986	Combines the sweep and mystery of a role-playing adventure with the strategy and tactics of a war game. With 360-degree graphics, this one's unique. For ages 12+.†	C 64/128. Joystick.	90-day warranty.	★★★★	★★	★★★	★★★	A	★★★★
MEAN 18 Accolade, Inc. 20863 Stevens Creek Blvd. Cupertino, CA 95014 (408) 446-5757 $45–$50 ©1986	Not only a golf game, but a construction set that lets you design your own 18-hole courses. Includes variable difficulty levels, practice holes, and a putting green. Clearly a birdie.†	Reviewed on IBM PC/ PC*jr*.* Also for Amiga, Atari 520ST.	90-day warranty. $10 thereafter.	★★★★	★★★★	★★★★	★★★	D	★★★★
RDF 1985 Strategic Simulations, Inc. 1046 N. Rengstorff Ave. Mountain View, CA 94043 (415) 964-1200 $35 ©1985	Simulates a Persian Gulf clash between the Soviet Union and an American Rapid Deployment Force (RDF). Part of "When Superpowers Collide" series. First-rate and fast-moving. For ages 12+.	Reviewed on Apple. Also for C 64/128.	30-day warranty. $10 thereafter. $12 for backup.	★★★	★★★★	★★★★	★★	D	★★★
REACH FOR THE STARS Strategic Studies Group, distributed by Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 $45 ©1983	A political/financial/military simulation on a grand scale—the universe! Conquer, colonize, and exploit other planetary systems, or take on other empires and learn to coexist with them. For 1-4 players, ages 12+, this game is one of the year's best.†	Reviewed on Apple IIe/ IIc. Also for C 64/128.	30-day warranty. $10 thereafter.	★★★★	★★★★	★★★★	★★	D	★★★★
SHERLOCK HOLMES IN "ANOTHER BOW" Bantam Software 666 Fifth Ave. New York, NY 10103 (212) 765-6500 $35–$40 ©1985	You're the world's greatest consulting detective, out to crack a series of mysterious cases aboard a turn-of-the-century luxury liner. Rub elbows with some famous folks, such as Thomas Edison and Gertrude Stein. Ages 12+.	Reviewed on C 64/128. Also for Apple, IBM PC/ PC*jr*,* Macintosh.	90-day warranty. $5 thereafter.	★★	★★★★★	★★	★★★	D	★★
WIZARD'S CROWN Strategic Simulations, Inc. (*See above for address and phone*) $40 ©1985	What makes this role-playing fantasy so exceptional is its combination of *Ultima*-type adventures with a great tactical combat system. A must for all adventurers.†	Reviewed on Apple. Also for Atari, C 64/ 128.	30-day warranty. $10 thereafter. $12 for backup.	★★★★	★★★★	★★★★	★★★	A	★★★★

RATINGS KEY **O** Overall performance: **D** Documentation: **PS** Play-system: **GQ** Graphics quality: **EU** Ease of use: **V** Value for money: ★ Poor: ★★ Average: ★★★ Good: ★★★★ Excellent: N/A Not applicable: E Easy: A Average: D Difficult: † Longer review follows chart.

*Titles listed for the IBM PC/PC*jr* will also run on many IBM PC compatibles; owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility.

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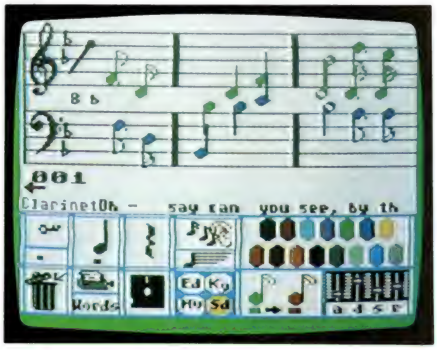
SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 92 for information such as backup policies and addresses of software publishers.

EDUCATION/ FUN LEARNING



The Music Studio

HARDWARE REQUIREMENTS: Amiga, Atari 520ST, C 64/128, IBM PC*jr*, Tandy 1000.
PUBLISHER: Activision
PRICE: $35-$60
PUBLISHER'S SUGGESTED AGES: 10+

Have you ever wanted to write music, but felt that you needed to know how to play an instrument first? Or have you ever been so bogged down writing one note at a time that you forgot the tune that had been running through your head?

The Music Studio solves both problems. It operates much like many popular graphics programs, with icon-based commands, several on-screen work areas, and pull-down menus for options. The main composing screen contains a grand staff in the center and all the building blocks of musical composition along the top and bottom. By using a joystick (or mouse) to move the cursor, you select key, time signature, dots, accents, triplets, tie bars, and accidentals (sharps, flats, and naturals).

My favorite screen is the Music Paintbox. Here you compose music without using standard notation. Instead, you simply move little rectangles (representing lengths of time) around the staff, listening to the notes as you cross spaces and lines, then place them where you want. At any time you can play your composition back, and when you return to the main screen, your song is converted to standard musical notation.

The Music Studio is fun, although my musician husband was frustrated by being unable to change time signatures part way through a piece. In general, though, there are far more pluses than minuses to this package. I felt like music was suddenly more accessible to me than it had been before. That's computing at its best—bringing you closer to your interests.

—MARLENE BUMGARNER ELTGROTH

Ticket to Paris

HARDWARE REQUIREMENTS: 128K Apple IIe/IIc, C 64/128, IBM PC/PC*jr*.
PUBLISHER: Blue Lion Software
PRICE: $30-$40
PUBLISHER'S SUGGESTED AGES: 14+

Your eccentric cousin has gone to Paris. He refuses to return until you follow him there and learn to appreciate the "City of Lights," too. So goes the opening premise of *Ticket to Paris*, which provides a map of the city and a simple French-English dictionary. You also start out with some money, a calendar/score card, and two weeks in which to find your cousin.

As you explore the city, you're accosted repeatedly by the beautiful, but annoying "quizzing woman." Her presence is ultimately helpful, though, since your conversations with her gradually teach you about Paris. Correct answers to her questions earn the points you need to win the game. A multiple-choice format here gives even beginning French students a chance to play.

As points accumulate, clues to your cousin's whereabouts flash across the screen. When you follow up on a clue within two days, your cousin will appear, but he won't come home with you until you've earned 250 points and solved five clues.

Is it really like a trip to Paris? About as much as flight simulation programs are really like flying an airplane. Maps of Paris and prices are reasonably accurate. Upon hearing

how much money the game allots for a two-week stay, my sister who had just returned from France commented, "You'll have to live on baguettes and cheese!" She was right. Until we knew our way around well enough to find clues quickly, we ran out of money before finishing our first several games.

Ticket to Paris is an attractive way to add cultural enrichment that's too often missing from beginning language lessons. It kept our family entertained long after a textbook would have been tossed aside. In fact, we're still playing. *A bientôt, alors!*

—TAN A. SUMMERS

HOME BUSINESS & PRODUCTIVITY

DeluxePaint

HARDWARE REQUIREMENTS: Amiga.
PUBLISHER: Electronic Arts
PRICE: $100

When my wife first saw me working with *DeluxePaint*, a drawing program for the Amiga, she asked a tough question. "It's very nice, but what can you do with it?"

She wanted practical uses. So I displayed some puzzles I had created and sold to a children's science magazine, and told her, "These will pay for the new front door." Then I rested my case.

If you have an Amiga, you'll also find good uses for *DeluxePaint*. You may print your own artwork, make up one-of-a-kind greeting cards and stationery, plan landscaping and flower beds, visualize room-decorating schemes, or (my favorite) simply unwind.

You select most commands and do all drawing with the mouse. The keyboard figures in only rarely; for example, to add text to images. The program is best learned by exploring it—especially since the short manual with one illustration gives short shrift to some powerful commands.

Among the extensive features are

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IBM PC, PCjr, & compatibles, Apple II+, IIe, and IIc, Commodore 64/128, Atari 520ST, and CP/M.

Printers supported on the IBM PC version:
ALPS P2000; ATT 473; Blue Chip; BMC; Brother Twinwriter; Citizen MSP-10 and MSP-20; C.Itoh Prowriter 8510 and Prowriter Jr.; Data Products SPG 8010-2, 8012, 8021, 8022, 8051, 8052, 8071, and 8072; Diablo P10I, P12I, P12CQI, P32CQI, and 34LQ;EPSON FX, JX, LX, RX, LQ-1500, and MX (with Graftrax); HP Thinkjet; IBM Color Dot Matrix, Compact Thermal, Graphics Printer, and Quietwriter II; IDS Prism; Legend 880 and 1080; Mannesman Tally MT 280, 480, 85, 86 and Spirit 80; MPI 99S, 99SX and 99X; NEC P2/P3 Pinwriter, 8023A and 8027; Okidata 82A/83A with Okigraph 1, 84 (step II), 92, 93, 182, 183, 192, 193, Okimate 20 and 2410; Panasonic KX-P 1090, 1091, 1092 and EP-1505; Smith Corona D100 and D300; Star Gemini 10, 15, 10X and 15X; Tandy CGP 220, DMP 105, 110, 120, 130, 200, 400, 420, 430, 500, 2100, 2100P and 2200; TI 855; Toshiba 1340, 1350, 1351 and P351

Printers supported on the Commodore version:
C.Itoh Prowriter 8510; Commodore VIC-1525 and MPS-801 and 803; EPSON RX,FX, LX, and MX (with Graftrax); Gorilla Banana; Okidata 92, 93, 192, 193, and Okimate 10; Star Gemini 10, 15, and SL10C

Printers supported on the Apple version:
Apple Imagewriter and Scribe; C.Itoh Prowriter 8510; EPSON FX-80/100, RX-80/100, and MX-80 (with Graftrax); Okidata 92 and 93; Star Gemini 10 and 15

Printers supported on the Atari version:
Blue Chip; C.Itoh Prowriter 8510; EPSON FX, RX, LQ-1500, and MX (with Graftrax); IBM Graphics Printer, Color, and ProPrinter; Okidata 82A/83A with Okigraph 1, 84 (Step II), 92, and 93; Star Gemini 10 and 15; Toshiba 1340, 1350, 1351, and P351

Printers supported on the CP/M (EPSON & Kaypro) version:
C.Itoh Prowriter 8510; EPSON FX, RX, LQ-1500, and MX (with Graftrax); IBM Graphics Printer; Okidata 82A/83A with Okigraph 1, 92, and 93; Star Gemini 10 and 15; Tandy DMP 105, 130, 430, 2100, and 2200; Toshiba 1340, 1350, 1351, and P351

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For Commodore 64 and 128

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For Atari 520ST

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Art Gallery II	$29.95	_____

For CP/M (Kaypro II format)

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Art Gallery II	$29.95	_____

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SOFTWARE REVIEWS

an air brush that works like the real thing and a function that lets you take any portion of the image on-screen and make it into a custom paint brush. A mirror command helps you create polygons and kaleidoscopic images with up to 40-fold symmetry. And for detailed work, you can paint as you magnify an image, working pixel by pixel.

But some bugs still lurk. You'll freeze the computer if you magnify too much of a picture. Also, if you activate both magnify and mirror-draw settings, you may find that the only parts of a figure actually drawn were those inside the magnify window. Even so, this icon-based graphics program is a fine addition to any Amiga software library.

—DAVID POWELL

Easy3D

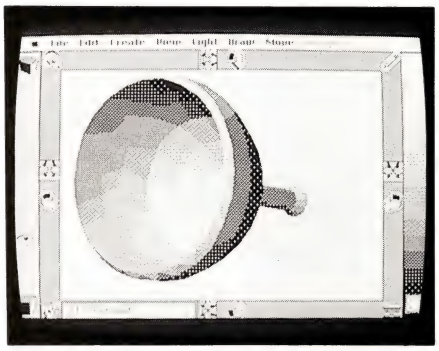
HARDWARE REQUIREMENTS: 512K Macintosh.
PUBLISHER: Enabling Technologies, Inc.
PRICE: $149

Look. There's a goblet on the screen. Click on an icon, drag the mouse, and you can change the goblet's vertical or horizontal proportions. Big deal, right? Well, how about this: click on another icon, drag the mouse, and look inside the goblet!

Easy3D is subtitled "hidden surface modeling software." That means that the program keeps track of the parts of an object that aren't visible, so you can work in a three-dimensional graphics world on your Macintosh screen.

You're given a number of ways to build a three-dimensional object. Start with a primitive shape, such as a sphere, a cube, or the donut-shaped torus. Or design an object with the "lathe." Use the mouse to trace the contours of your shape, then the lathe turns it into a symmetrical three-dimensional object. Or create a new object with an "anti-matter merge" that cuts out a portion of an existing object. Once you have a few objects, you can "glue" them together to behave as a single object, or just work with them as separate entities that can be copied and manipulated.

Any object can be looked at from any angle. In fact, you can see four different views of the same shape at once. Objects can be shaded in patterns of gray. The darkest shade depends on how much "ambient" light there is; you control this by dragging a sun icon up and down.



If you like what you've made, save your picture for further enhancements in *MacPaint* (Apple Computer), for your own programming, or for use in such packages as *VideoWorks* (Hayden Software) or *Slide Show Magician* (Magnum Software).

Easy3D isn't perfect; there are occasional glitches so that an object you've distorted in some way reverts to its original form when you switch views. But imperfections hardly matter when you have a three-dimensional universe to explore. I've no doubt that *Easy3D* has lots of practical and educational possibilities, but at the moment I don't care what they are. It's so fascinating that just playing with it is interesting enough.

—SHARON AKER

SwiftCalc 128

HARDWARE REQUIREMENTS: C 128.
PUBLISHER: Timeworks, Inc.
PRICE: $70

Are you a computing beginner who has heard how an electronic spreadsheet can work for you, but you've never tried one? Or are you experienced with computers and looking for a powerful, easily learned tool for budgeting and other numerical manipulations?

Whichever category you fall into, *SwiftCalc 128* can fit the bill. This package not only does what it promises, but does so in an exemplary fashion. Especially helpful for novices, the manual is straightforward and clear—and you can call the free Tech Support Hotline for answers not found in the manual. For instance, when I couldn't configure part of the program, a quick call netted several friendly suggestions, one of which worked the first time.

But you may rarely need the manual, since a single keystroke lets you access the pull-down command menus and help screens. Information can be keyed in from scratch or imported from a data base created with Timeworks' *Data Manager 128*. A "Quick Entry Key" feature

lets you type in the first year, month, day, or number in a series, and *SwiftCalc* will enter the rest automatically.

Besides the spreadsheet itself, the package includes two extras. *Sideways* (a separate program that runs in C 64 mode) allows you to print wide spreadsheets vertically down the page. The first time you see this, you'll wonder how you ever got along without it. There's also a limited graphing feature that converts your figures into charts comprised of asterisks. Not the most impressive part of this package; still, *SwiftCalc* never tried to pass itself off as a Lotus' *1-2-3* clone.

Overall, I find this an excellent program that possesses all the basics of a professional spreadsheet. In the picky department, I wish it had the capability to sort rows (in addition to columns) in numerical or alphabetical order. But *SwiftCalc 128* is an honest value. I recommend it.

(Note: A newer version, received after this review, includes both high-resolution graphing and the ability to sort by rows.) —SUNOW BRADLEY

ENTERTAINMENT

The Lords of Midnight

HARDWARE REQUIREMENTS: C 64/128.
PUBLISHER: Mindscape, Inc.
PRICE: $20
CRITIC'S SUGGESTED AGES: 12+

Whether you're an adventurer who likes the strategy and tactics found in war games, or a war gamer who enjoys the questing of adventure programs, consider *The Lords of Midnight*. It's an exciting new hybrid (a game combining aspects of different genres) that synthesizes the sweep and mystery of a role-playing adventure with the planning and execution of battles traditionally found in a war game. What's more, you can elect to play the program as a straight adventure or as a war game.

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SOFTWARE REVIEWS

You begin the full game in control of a small group of characters. Guiding them across a fantasy world—created in high-res with wraparound graphics—your object is to free the Land of Midnight from Doomdark the Witchking. With each turn, you can travel, seek shelter, find and use various objects, or engage in combat against single opponents, groups, and even whole armies.

Although playtesters indicated that the map supplied in the documentation is inadequate, they found the program easy to operate. And despite the game's slow pace, everyone thought it was fun and involving. All in all, *The Lords of Midnight* delivers a novel approach to traditional material.

Mean 18

HARDWARE REQUIREMENTS: Amiga, Atari 520ST, IBM PC/PC*jr*.
PUBLISHER: Accolade, Inc.
PRICE: $45-$50
CRITIC'S SUGGESTED AGES: 8+

Our next hybrid game this month is also the first of its kind—a golf simulation that doubles as a construction set. The basic golf program lets you play a round on your choice of courses: your "home turf" (the fictional Bush Hill Country Club) or three real and renowned courses—St. Andrews in Scotland, Pebble Beach in California, and the Augusta National in Georgia.

After learning the strokes on practice holes, a driving range, and a putting green, you can either play by yourself, as part of a foursome, or in teams. You choose from variable difficulty levels, and there's even a computer-assisted mode for novices.

But it's *Mean 18*'s architect feature—used to create the four courses that come on the disk—that sets it apart. You can start from scratch and build any size and shape golf course you desire or simply modify the existing ones. Select from six tree and bush types, various water and sand traps, and different putting greens. Move the holes, the tees, and even redraw the skyline.

You'll probably want to save your homemade courses and polish them by trial and error until you've created a highly playable series of golf courses. *Mean 18* is a highly recommended hybrid game.

Reach for the Stars

HARDWARE REQUIREMENTS: Apple IIe/IIc, C 64/128.
PUBLISHER: Strategic Studies Group, distributed by Electronic Arts
PRICE: $45
CRITIC'S SUGGESTED AGES: 12+

If *Colonial Conquest* were a galactic game instead of a global one, it would be *Reach for the Stars*—the first political/financial/military simulation set in outer space. Here's strategy on a grand scale, covering the exploration, colonization, conquest, and exploitation of the galaxy.

Each of up to four players (including computer opponents) begins with one planet in a home star system. As the game progresses, you can form and break alliances, devel-

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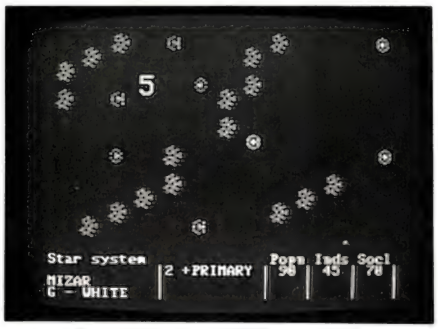
op natural resources, build up your world's social structure, push your research and development teams to build bigger and better starships, and start to explore and expand into surrounding star systems.



A balance must be maintained between this expansion, your social and technological development, and defensive forces, because all the time you're building your strength, your opponents are doing the same. Space squadrons do battle, massive transport fleets ferry armies from sector to sector, and all the while the clock ticks until time runs out. Then you count up the points and a winner is declared.

Reach for the Stars is one of the year's best games, requiring strategy, resource management, diplomacy (in multiplayer games), and sensitivity to the needs and desires of your subjects. It will probably be as exciting, thoughtful, and provocative in three years as it is today.

Wizard's Crown

HARDWARE REQUIREMENTS: Apple, Atari, C 64/128.
PUBLISHER: Strategic Simulations, Inc.
PRICE: $40
CRITIC'S SUGGESTED AGES: 10+

Wizard's Crown (the fourth hybrid game reviewed this month) merges *Ultima*-type fantasy quests with a tactical combat system similar to *Galactic Adventures*—but with the inspired addition of magic.

You start play by creating a group of stalwart adventurers, or use any of the eight characters that come on disk. Not only can you make up your party from the usual professions (fighters, magicians, thieves, and so on), you have the unique option of giving your characters as many vocations as you please. Thus you may create thief/fighter/magicians, priest/ranger/fighters, or even such unlikely combinations as priest/magician/fighter/monks!

By guiding your hybridized heroes through encounters with a universe of opponents, you can build their ability levels up to stupendous heights, with dozens of different skills. Although that takes a long time, it makes for the most powerful characters we've ever seen in an adventure. When these fully developed characters fight, each encounter reflects the sort of combat system many gamers have dreamed about for years, as the effect of every arrow, sword thrust, and successfully cast spell can be seen.

Wizard's Crown will have long-term influences on computer gaming. It's a must for every level of adventure fan. —REVIEWS BY JAMES DELSON

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Talking Text Writer

Talking Text Writer is a software program that combines the use of word processing with a speech synthesizer, enabling students to explore and use written language with a natural curiosity and interest. With the Talking Text Writer, students can write letters, words, sentences, stories, and other text and hear what they write.

As a word processing program, Talking Text Writer can be used to store files on a data disk for future retrieval. Text can be inserted, moved, copied, altered, and deleted through a wide range of program commands.

Talking Text Writer is a learning tool for a wide range of beginners. It provides support, feedback and repetition. Talking Text Writer gives students the control to individually orchestrate their own learning needs by allowing them to:

1) See the text and control how they want it to look by changing screen colors, margins, and size of text.

2) Hear and control the speech output—using either the voice box or a headset.

3) Use the keyboard for those students who have difficulty using pen and pencil.

Various kinds of text and related practice exercises can be easily tailored to each student's individual needs and preferences, making the educational experience richer and more effective for both teacher and student.

Pre-schoolers can explore letter sounds and words in the context of their personal experience. Primary school children learning English can write their own stories, experimenting with sounds, words, and ideas. Being able to experiment with language and express ideas helps students build self confidence. Available for the Apple IIc & IIe, the list price for the home version is $199.95 and can be purchased through local dealers. For additional information about Talking Text Writer: Scholastic Software, Department JS, 730 Broadway, New York, NY 10003

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Available for the Apple II (64K required) family of computers. The home edition of MATH SHOP, with one double-sided program disk and a reference guide, lists for $49.95. It includes a double-sided program disk and a User's Guide.

Scholastic Software's MATH SHOP can be ordered through local Scholastic Sales Representatives and dealers. For ordering information, write to: Inquiry Department, Scholastic Inc., P.O. Box 7501, 2931 East McCarty Street, Jefferson City, MO 65102. Scholastic ordering number: (800) 325-6149.

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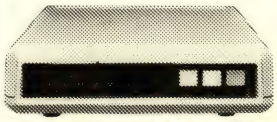

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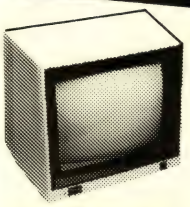

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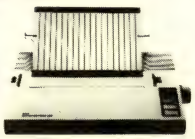

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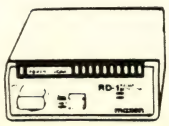

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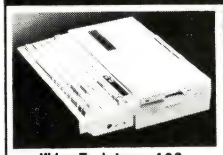

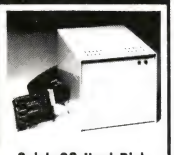

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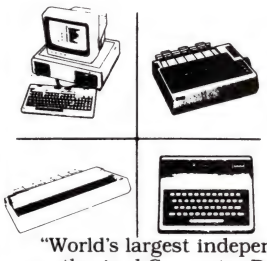

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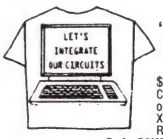

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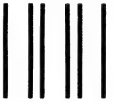

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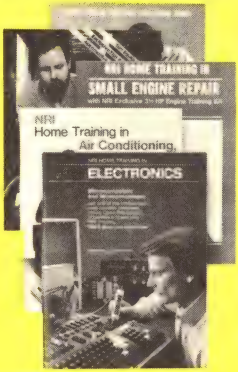

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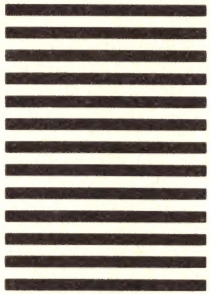

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Parents: Please answer the following questions.

1. Do you use a computer to operate a business from your home?

☐ Yes ☐ No

2. If yes, which of the following do you use in your home business?

HARDWARE
- a. Monitor
- b. Printer
- c. Disk Drive
- d. Modem

SOFTWARE
- e. Spreadsheet
- f. Data Base
- g. Word Processing
- h. Accounting

3. Which computer do you use in your home business?
- a. Commodore
- b. Apple
- c. IBM
- d. Compaq
- e. Tandy
- f. Leading Edge
- g. Other

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